

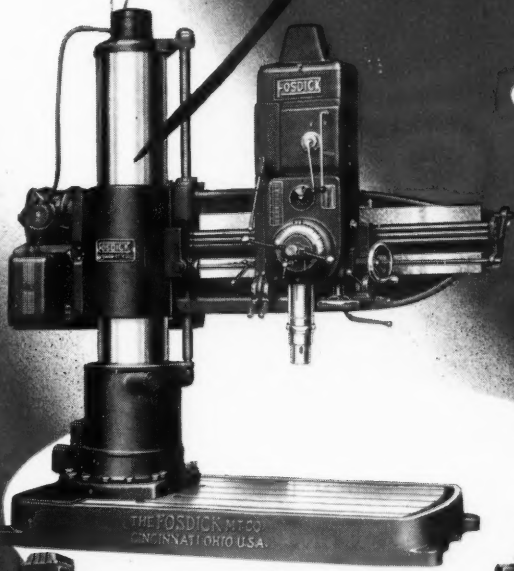
TECHNOLOGY DEPARTMENT

September, 1948

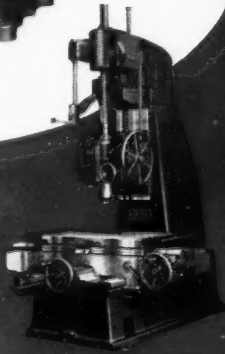
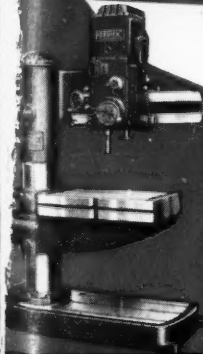
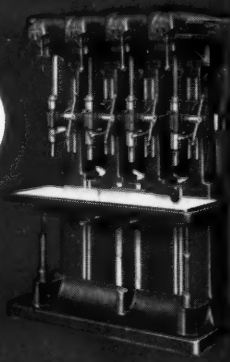
MODERN

Machine Shop

Fosdick



- JIG BORERS
- RADIAL DRILLS
- SENSITIVE DRILLS



GORTON Duplicators Give You

Production Plus . . .

Lower "Short Run" Costs

Gorton Duplicators are highly versatile and are designed for profiling and duplicating all kinds of dies and molds for plastics, rubber, glass, drop forging dies, metal patterns, die casting dies. They are precision built to handle either production assignments or short runs.

For example, the Jacobson Manufacturing Co. of Racine, Wisconsin had a small quantity of piston heads reshaped to a complicated design for the purpose of reducing compression. These were for small gasoline engines. To do this by conventional methods, would have taken several hours per piece. The time per piece on the Gorton was less than 20 minutes. (See Job Facts) and each was an exact duplicate in shape and dimensions — an important requirement in this case.

Gorton equipment may save you money. Write for free Bulletin 1855 — see coupon below — or inquire about Gorton Engineering Service.

JOB FACTS!

JOB "Short Run" duplicating of piston head shape
MATERIAL Aluminum Alloy
MACHINE Gorton Duplicator with Tracer Control
CUTTERS $\frac{3}{8}$ " Tung-carbide shaped to fit angles of master; 2 flute
SPEED 4560 R.P.M.
NO. OF PIECES 20
SET-UP TIME 4 hours
TIME TO FINISH 6 hours (all 20 pieces)
REMARKS Minimum hand work required. Same cutter and stylus used throughout. Dia. of pistons 2". Max. depth of cut $15/32$ ".



GEORGE **GORTON** MACHINE CO.

Tracer Controlled Milling

129 RACINE STREET, RACINE, WISCONSIN, U. S. A.

Please Send Without Obligation
 Bulletin No. 1709 - 1655

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VOLUME 21

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DETROIT

MODERN

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MEMBER



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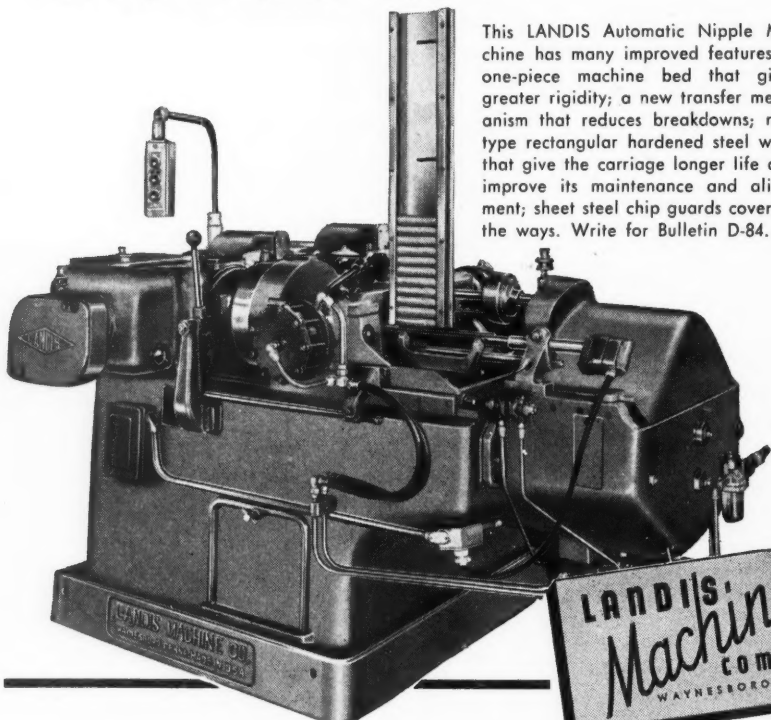
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THE **IMPROVED** **AUTOMATIC** **NIPPLE** **MACHINE**

The improved LANDIS Automatic Nipple Machine threads, reams, and chamfers nipples on **both** ends in a continuous automatic operation, eliminating secondary manual handling. Two nipples are completely machined on one end during the operation cycle. The semi-finished nipple is transferred end-to-end from the left-hand to the right-hand carriage by mechanical fingers for the operation on the opposite end. Finished nipples are ejected automatically. Production ranges from 200 to 625 per hour, depending on the pipe size.



This LANDIS Automatic Nipple Machine has many improved features: a one-piece machine bed that gives greater rigidity; a new transfer mechanism that reduces breakdowns; new type rectangular hardened steel ways that give the carriage longer life and improve its maintenance and alignment; sheet steel chip guards covering the ways. Write for Bulletin D-84.

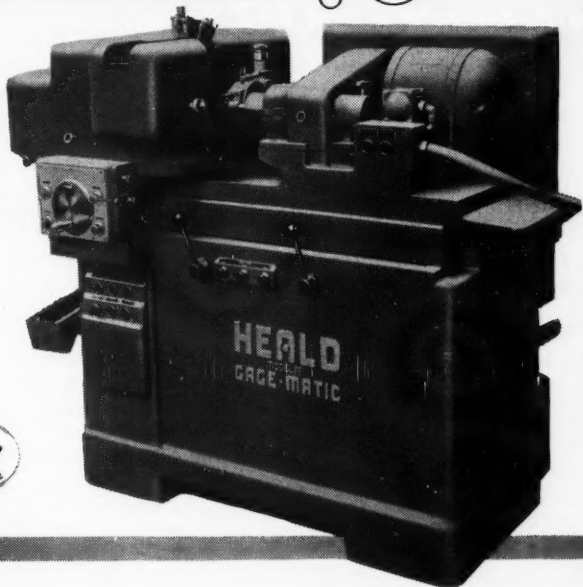


Completely New Completely Automatic

MODEL 181 HEALD CENTERLESS



Designed for
high-speed
precision
finishing of
small parts



From base to bridge, this Heald Model 181 Internal Centerless is entirely new. It offers many advanced features that mean long-range economy in the internal grinding of small to medium size work that can be rotated on its outside diameter.

The machining cycle is completely automatic from the time the work rolls from the loading chute until it drops out as a finished part. One operator can easily handle several machines. Like the other new Heald models, it also incorporates such outstanding features as: *New Feed Mechanism—Uniform Speeds and Feeds—Sealed Hydraulic*

System—Centralized Controls—Anti-friction Cross-Slide—Rapid Machine Cycles—Automatic Lubrication—Isolated Power Unit.

The Heald principle of centerless internal grinding represents years of background and skill in producing machines that continually set the pace for high-speed precision finishing.

For complete information on this latest development in precision finishing, call your nearest Heald branch office representative.

THE HEALD MACHINE COMPANY, Worcester 6, Mass.

Branch Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York



FAST, HEAVY-DUTY HONING

for a wide variety of short-run jobs

*now practical
and profitable*

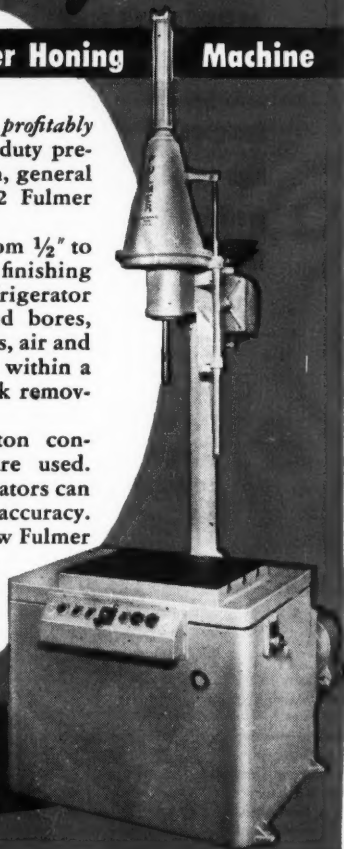
with the new model 412 Fulmer Honing Machine

Now, both large and small shops can *profitably* apply the many advantages of fast, heavy-duty precision honing to a wide range of short-run, general purpose work—with the new Model 412 Fulmer Honing Machine.

Any type of internal cylindrical surface from $\frac{1}{2}$ " to 4" diameter can be honed. Highly accurate finishing of automotive cylinders, sleeves, dies, refrigerator and compressor cylinders, connecting rod bores, bushings, bearing housings and races, valves, air and hydraulic cylinders, etc., can be produced within a fraction of the time required by other stock removing processes.

All honing operations are push-button controlled. Conventional honing tools are used. Operation is simple. Inexperienced operators can obtain fast stock removal and extreme accuracy. Involving a *minimum* investment, the new Fulmer Model 412 now makes high production honing available to *all* shops. Investigate the Model 412 for your production. Write today for details and complete machine specifications.

FULMER MODEL 412 HONING MACHINE
Single Spindle • $\frac{1}{2}$ " to 4" Honing Capacity
12" Stroke • Full Hydraulic Reciprocation



C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

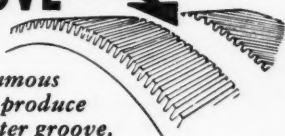
FULMER

PRECISION PRODUCTION EQUIPMENT

★ Honing Machines • Rod Bore • Piston Ring Lappers

Why FARREL HERRINGBONE GEARS HAVE NO CENTER GROOVE

The machines used in cutting Farrel gears—famous Farrel-Sykes gear generators—are able to produce continuous tooth herringbone gears. The center groove, required for tool clearance by other machines, is replaced by useful working tooth area.



WHAT this means to you

Continuous teeth mean increased strength and extra load-carrying capacity in smaller space. Generation by the Farrel-Sykes process means extreme accuracy of tooth contour and tooth division which pays off in smoother, quieter operation.

Known as the *Gear with a Backbone*, these gears are available in any size up to 20 feet in diameter, for practically any application. Information and engineering assistance available, without obligation.



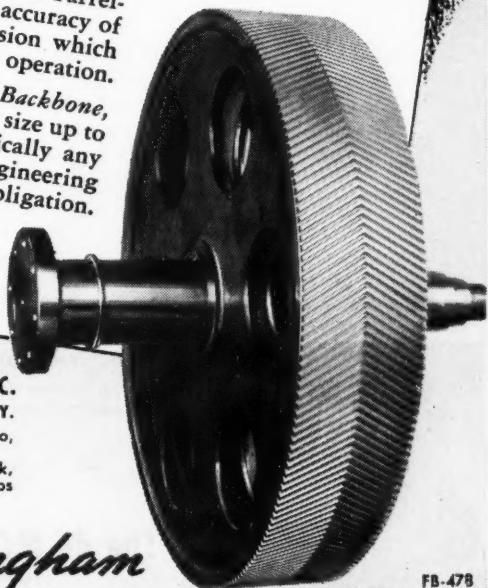
FARREL-BIRMINGHAM CO., INC.

344 VULCAN STREET, BUFFALO 7, N. Y.

Plants: Ansonia and Derby, Conn.; Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston

Farrel-Birmingham



FB-478



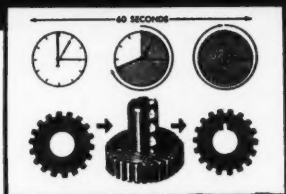
This "Minute Man"[®] KIT OF FINE TOOLS

**SAVES
YOU
MINUTES
AND
MONEY**



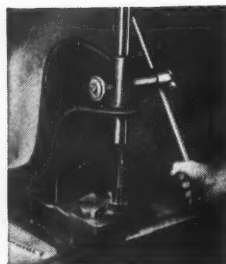
HERE'S HOW IT WORKS

You simply drop the right size bushing in the bore, insert the precision broach and press it through, using a shim and second pass to get the exact depth. In sixty seconds you have a clean, accurate keyway in any gear, pulley hub, coupling, collar, milling cutter or what have you.



Are You Willing To Be Shown?
Ask your *Industrial Distributor* to show you the du MONT Minute Man Keyway Broach Kit in its handsome hardwood case, or

MAIL THIS COUPON



The duMONT CORPORATION, GREENFIELD, MASS.

Please mail me the Minute Man Manual "S" containing complete information, prices and valuable reference data.

Name Position

Company

Address

The du MONT CORPORATION

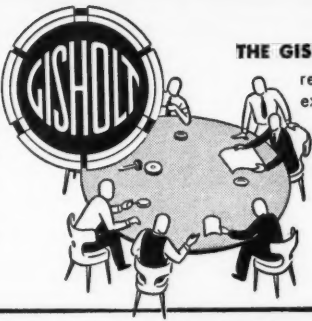
GREENFIELD, MASSACHUSETTS

SUPERFINISH ***could have prevented this!***

Enlargement shows a scored and galled surface of a $3\frac{1}{2}$ " O.D. bearing that "froze" and failed. Had this surface first been superfinished, it would have had nearly twice the load-bearing capacity and about three times the life. "Wear and Surface Finish," is a new textbook on Superfinish. Write for it on your company letterhead.

GISHOLT MACHINE COMPANY

Madison 10, • Wisconsin



THE GISHOLT ROUND TABLE

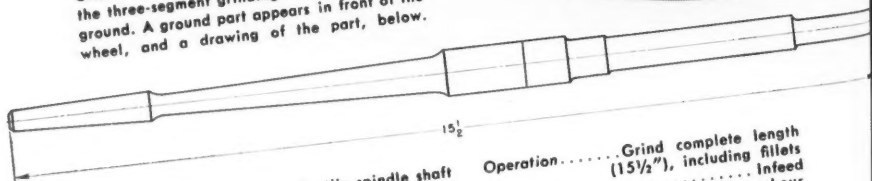
represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts.

Your problems are welcomed here.

SEVEN DIAMETERS ON SLENDER



CINCINNATI FILMATIC No. 3 Centerless Grinder, increased in width to accommodate the three-segment grinding wheel in the foreground. A ground part appears in front of the wheel, and a drawing of the part, below.



Part Name.....Textile spindle shaft
Material.....Hardened steel
Stock Removal......018"

Operation.....Grind complete length
(15 1/2"), including fillets
Method.....Infeed
Production.....22 per hour

15 $\frac{1}{2}$ " SHAFT

ground in one operation

● Combine "n" operations into one, and you divide their total cost by approximately "n." This simple mathematical relationship is demonstrated by the equipment and operation shown here. The parts are textile spindle shafts. They have seven diameters, two of which are tapered. All diameters on the complete length of the shaft, including fillets, are ground in one operation on a CINCINNATI FILMATIC No. 3 Centerless Grinder. ¶ As you might suspect, Cincinnati Application Engineers had a hand in this job. The machine was widened to take care of the extra wide wheels . . . profile truing units over the grinding and regulating wheels accurately true them to the required shape . . . a load-

ing attachment lowers the part to the work rest blade between the wheels.

¶ The sound design of CINCINNATI Centerless Grinders, supported by the many advantages of FILMATIC grinding wheel spindle bearings, give Cincinnati Application Engineers fine basic material with which to devise new cost saving methods in precision grinding. These men would like to show you what can be done about reducing costs in your shop. Send blueprint and complete details, or arrange to visit us in person. Meanwhile, write for a copy of catalog G-570.



It's new! In one conveniently indexed catalog you have a summary of the complete CINCINNATI line. Machine tools: milling, broaching, diesinking, cutter sharpening, optical projection profile grinding, precision grinding; lapping. Flame hardening machines. Cutting fluid. Write for a copy, M-1646.



CINCINNATI GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES

EXCEPTIONAL ACCURACY, SPEED AND POWER

No. 50 PRECISION BORING AND VERTICAL MILLING MACHINE

- ★ Reduces Set-Up Time To A Minimum
- ★ Eliminates Time-Wasting Work Transfers
- ★ Multiple Operation On A Single Machine
- ★ Greater Output At Lower Unit Cost

The No. 50 is a machine built for precision as well as speed ... with unusual ability to handle an extreme range of different and difficult jobs. Simple and convenient to operate — ruggedly constructed for many years of tough, trouble-free service — the Knight Miller offers worthwhile savings in greater output, lower production costs and improved quality of work.

*Write for Complete
Catalog Details*

Sixteen spindle speeds, 40 to 2,000 r.p.m. • 9 spindle feeds, .005" to .010" • 100" table traverse per minute in both directions • 16 table feeds, $\frac{3}{16}$ " to 20" per minute • 7½ h.p. drive.



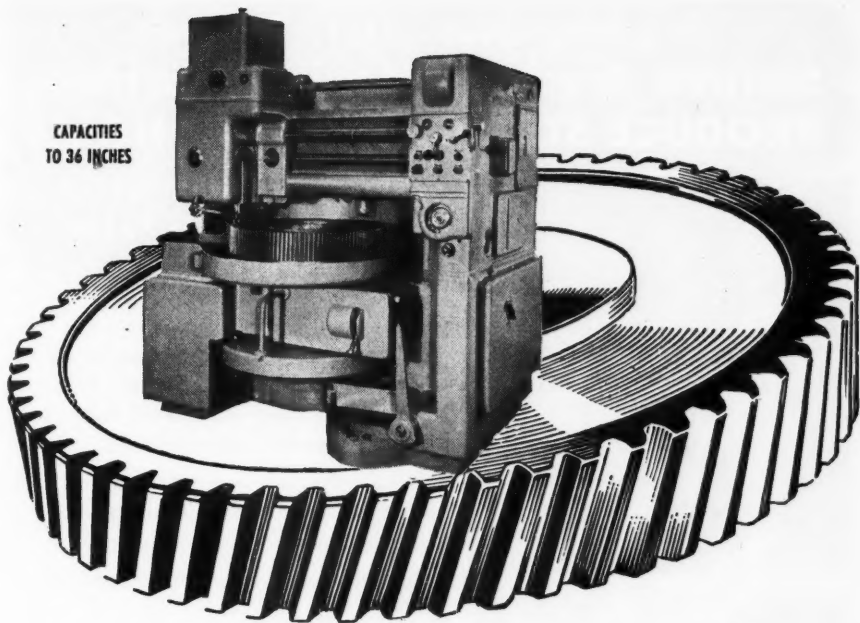
W. B. KNIGHT

MACHINERY COMPANY

MORE GOODS for MORE PEOPLE at LOWER COST

3920 WEST PINE BLVD. • ST. LOUIS 8, MISSOURI

CAPACITIES
TO 36 INCHES



IN GEAR CUTTING

QUALITY COMES FIRST ... then LOW COST

Precision is a tradition with Fellows... that is why you are always certain of high-quality gears when they are generated on the Gear Shaper. Machines, such as the new 36-inch "All-Purpose" Gear Shaper, assure exact duplicating accuracy at the lowest possible cost per piece. Again, your Gear Shaper never asks for "Time off" for it can be used for such a wide variety of work. Bulletins are available on a complete line of Gear Shapers with capacities up to 100 inches.

Fellows

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York 1.

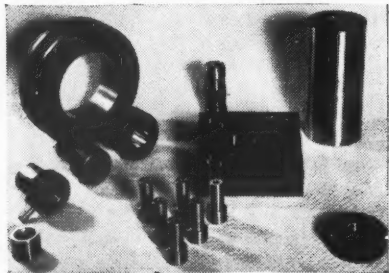
In Tools, Dies, Jigs, Fixtures
Sunnen Precision Honing Machines
PRODUCE STRAIGHT ROUND HOLES



Accurate Within .00005"
Up to 10 Times Faster
Than Lapping

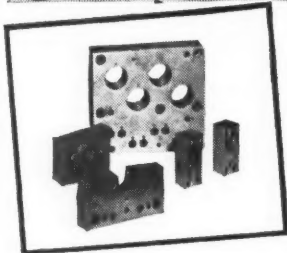
Tool and die shops and tool rooms everywhere are turning to Sunnen Precision Honing as a fast, economical method of producing smooth, accurate holes.

Here's why they use it to fit dowel pins, ejector pins, die and jig bushings—and to finish ring gauges and extrusion dies.



- Smooth surface finish — increases life of parts
- Extremely accurate — tolerances held to twenty millionths of an inch
- Wide range of sizes — hones any diameter from .120" to 2.625"
- Corrects distortion, bell-mouth, taper, out-of-round holes
- Machine — completely equipped with honing tools for range .120" to 2.625" — less than \$1400

Write today for bulletin giving complete details—or call in a Sunnen engineer.



TOOL ROOM MANDREL SETS—Now available for your use. These convenient Mandrel Sets consist of completely assembled honing units shipped in time and space-saving storage racks. Four sets cover complete range from 1/8" to 2 5/8" in diameter. Save time and money by purchasing complete sets.


SUNNEN PRODUCTS COMPANY • 7975 Manchester Ave., St. Louis 17, Mo.

Canadian Factory: Chatham, Ontario

375

SUNNEN PRECISION HONING
TRADE MARK REG. U. S. PAT. OFF. - MARCA REGISTRADA

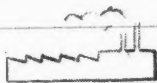
Over 1,000,000 Hours of Trouble Free Precision Grinding . . . with Microsphere Bearings

A leading builder of 

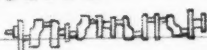
Reports using many **LANDIS TOOL** grinders



Is just one



To precision grind



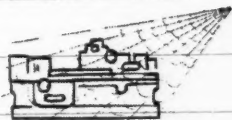
All day



Year after year



Without downtime for spindle bearings



This tells the secret



And what it can mean to you



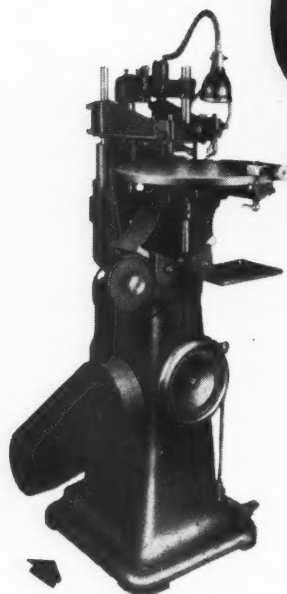
LANDIS TOOL
Precision Grinders

Write for Bulletin MB48

LANDIS TOOL COMPANY

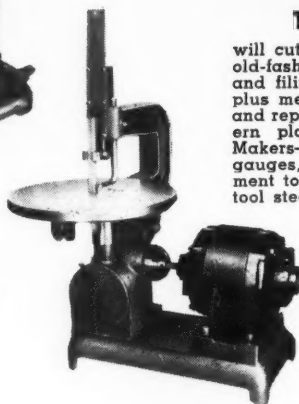
10 E. Sixth Street, Waynesboro, Pa.

Make
BETTER DIES
*Easier -
 Faster -
 Cheaper!*



Heavy Duty

This model saws and files tool steel up to 3" thick, to center of 20" circle. V-belt drive, constant controlled pressure feed, variable stroke, six speeds. Table tilts 15° front, left or right; 3° back.



THE OLIVER DIE MAKER

will cut direct labor costs of making dies the old-fashioned way by 50% to 60%. By sawing and filing, instead of drilling to remove surplus metal, the Oliver speeds up die making and replaces much expensive labor. Most modern plants are equipped with Oliver Die Makers—all plants making their own dies, gauges, templates or cams, can use this equipment to great advantage to saw, file and lap tool steel.

The Bench Type S-1

Direct motor driven. Saws and files tool steel up to 1" thick, to center of 17" circle. Table tilts 10° right, left or forward. Also available as pedestal model.

SEND FOR CATALOG

IMPROVE YOUR TOOLROOM
 IT'S THE BACKBONE
 OF PRODUCTION

OLIVER
 OF ADRIAN

OLIVER INSTRUMENT CO.

1430 E. Maumee

Adrian, Michigan

AUTOMATIC DRILL GRINDERS
 TOOL & CUTTER GRINDERS—DRILL
 POINT THINNERS—TEMPLATE
 TOOL GRINDERS—FACE MILL
 GRINDERS—DIEMAKING MACHINES



STEEL



BRONZE



MAGNESIUM

Jarvis

ROTARY FILES



SERVE ALL INDUSTRIES



PLASTIC



ALUMINUM



WOOD COMPOSITION

Jarvis Rotary Files are ground-from-the-solid to give high speed, precise and economical service. These Jarvis Tungsten carbide files, as well as high speed rotary files are available in over a hundred different shapes and sizes to meet every material requirement. New manufacturing techniques followed in forming blanks and grinding flutes assure quality and performance and keep unit cost at a minimum. Additional economy is provided by Jarvis'

prompt regrinding service available to all users of Jarvis Rotary Files. These files can be accurately reground many times thereby appreciably reducing replacement costs. Coarse, standard, fine and superfine flutings are available from stock.

Jarvis Flexible Shaft Machines provide the ultimate in extra power and constant high speed to make tungsten carbide rotary files even more efficient.

Write for Literature on the quality line of Jarvis Power Tools.

Jarvis

POWER TOOLS

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

Tapping Attachments • Tecni-Taps and Dies • Rotary Files
Flexible Shafts and Machines • Quick Change Chucks & Collets

Semi-automatic **HANSON-WHITNEY** **THREAD GRINDING**

Featuring

- MASTER ROLL
- CRUSHER ROLL
- MULTI-RIB
- GRINDING WHEEL
- AUTOMATIC . . .
- EXCEPT LOADING
- ACCURATE THREADS
- AT HIGH SPEED
- NO THREAD
- DISTORTION
- FAST WHEEL
- DRESSING
- MORE PIECES PER
- DRESSING



... MACHINE

This new development now provides industry with a high speed production machine for multi-run grinding of external threads from the solid.

Hanson-Whitney design adds important features...

a Master Roll (A) to maintain life of the Crusher Roll (B), which in turn reshapes the Grinding Wheel to the required thread pattern... thread capacity to 2" lengths, produced in 11/6 revolutions of the work... accurate, properly mated threads, closer limits, size duplications... at highest speeds... and great decrease in rejects.

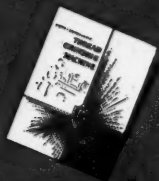
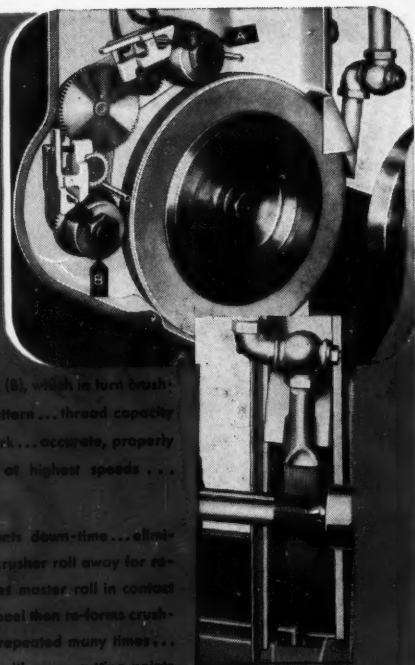
Master roll principle prevents down-time... eliminates necessity of sending crusher roll away for re-grinding. Rocker arm places master roll in contact with wheel for dressing. Wheel then re-forms crusher roll. The cycle may be repeated many times... for better cutting surface... with more cutting points on the wheel... less heat-generated in the work. Can't begin to tell the story here... so...

For details... read the NEW BULLETIN

HANSON-WHITNEY MACHINE CO., HARTFORD 2, CONN.
Division of Whitney-Hanson Industries, Inc.

Hanson Whitney

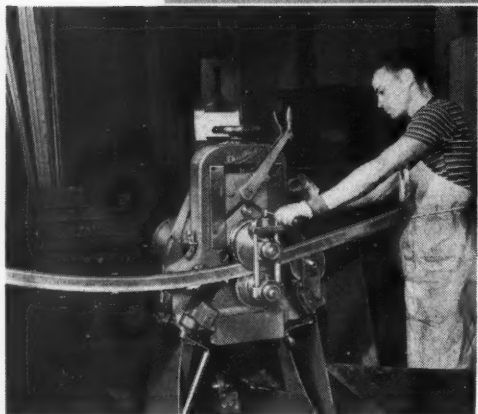
PIONEERS OF FINISHED TAPS



"Buffalo"

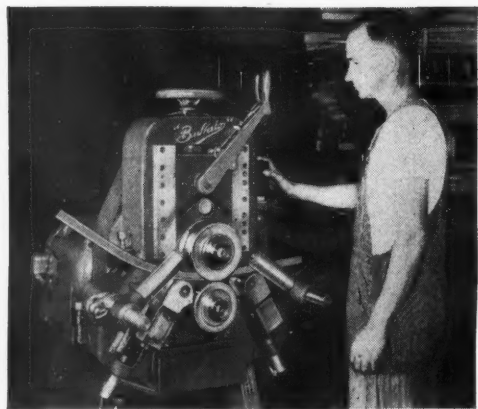
Type OA

BENDING ROLLS



REDUCE LABOR AND COSTS

• We know this by the success of these machines in hundreds of manufacturing plants where light segments are bent. Standard rolls for standard sections, with retooling done quickly. Special rolls for special shapes can be made. Inexperienced operators can easily turn out large quantities of accurately rolled shapes in a day. If you do metal bending, you'll do it cheaper with a "Buffalo" Bending Roll.



FASTER BENDING OF:

- arcs
- spirals
- circles
- special shapes

**Just Write for
Bulletin 3344-A**

BUFFALO FORGE COMPANY

388 Broadway

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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300-A,

300-R

G&L
GI

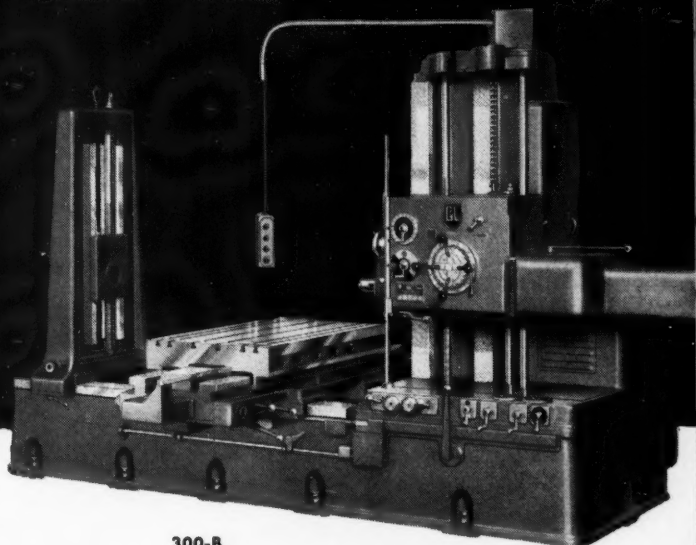
NEW

MEDIUM DUTY MACHINES FOR YOUR HIGH SPEED OPERATIONS

Of most recent design, the No. 300 Horizontal Boring, Drilling and Milling machine is made with either a built-in rotary or plain table. This machine is built for your high speed operations, and has the power and rigidity necessary to produce excellent finishes with great accuracy at high rates of speed and feed. A 10 HP AC motor drives the 3" spindle smoothly under the heaviest load.

Built-in scales and verniers give readings to .001" for headstock, table and saddle movements. A simple micrometer measuring attachment reading, with the use of standard measuring rods to .0001", may be provided if required.

G&L service engineers will gladly study the application of this machine, or any G&L, to your particular problem. Write for our six page bulletin describing the G&L 300-A, 300-B and 300-R.



300-B



300-R



SPINDLE DATA

Diameter	3.000"
Longitudinal Travel24"
Number of Speeds	36
Speed Range (RPM)	22 to 1600
Number of Feeds	18
Feed Range (Inches per Rev.)	
Between 22 and 180 RPM002 to .125
Between 200 and 1600 RPM0012 to .062

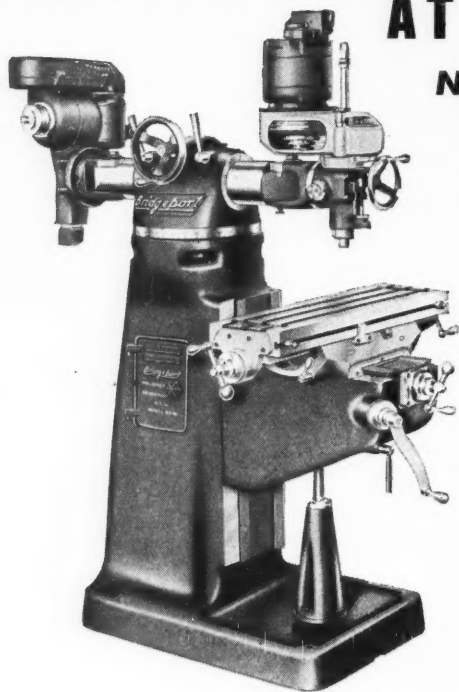
MACHINE DATA

	300-A	300-B	300-R
Working surface of Table	24"x42"	30"x48"	30"x36"
Cross Travel of Table	30"	36"	36"
Max. Saddle movement on bed with End Support in place	30"	36"	36"
Max. dist. face of Spindle Sleeve to End Support	60"	72"	72"
Headstock Travel on Column	30"	36"	33"
Number of Milling Feeds	23		
Range of Milling Feeds to Headstock, Table and Saddle in inches per minute1/16 to 30		
Motor Recommended	10 HP - 1750 RPM		
	(Dyn. Bal. .001" NEMA)		

GIDDINGS & LEWIS Machine Tool Company

MILLING, DRILLING AND BORING AT ALL ANGLES

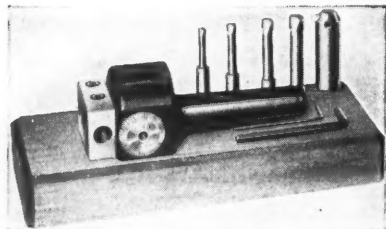
NEARLY 10,000 IN USE



You can use the Bridgeport Turret Milling Machine (with High Speed Attachment) for milling, drilling and boring *at all angles*, with maximum ease and convenience. It's a precision machine for production demands — accurate, sturdy, speedy, powerful.

The wide range and versatility of the Bridgeport Attachment enable it to serve as the complete central machine around which all operations revolve in many small shops. Features include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials. *Write for Bulletin.*

BRIDGEPORT No. 1 BORING HEAD



Specially designed for Bridgeport Machines and Attachments but equally efficient on other machines. Diameter of head, $2\frac{1}{4}$ ". Adjustment of slide, $\frac{3}{8}$ ". Three holes for $\frac{3}{8}$ " diameter boring tools giving a range of more than 5". Complete with 5 boring tools and necessary wrenches.

WRITE FOR BULLETIN

BRIDGEPORT MACHINES, INC.

52 REMER STREET

BRIDGEPORT, CONN.

New, all-purpose

ALLENUTS



**Patents
Applied
For**

Give you **HEAT - TREATED,
CLASS 3 FIT TAPPED THREADS
and DIMENSIONAL ACCURACY**
to match the holding power and
precision qualities of famous
ALLEN HEX-SOCKET SCREWS

Plus **THESE ADDED BENEFITS:**

1. Self-anchoring in non-hardened materials. By tightening screw only, ALLENUT is positively locked by biting action of knurled flutes being drawn into counterbored hole.

2. Anchoring feature does not prevent easy removal of ALLENUT. Fastening can be made any number of times without damage either to ALLENUT or surrounding material.

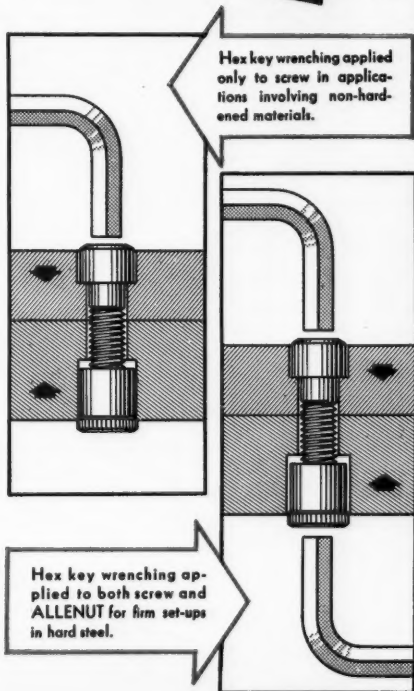
3. 12-point (double hex) socket and sturdy Allen hex keys provide positive, non-slip wrenching action where ALLENUT is countersunk in hardened steel.

4. Can be pressed into soft metals or molded into plastics. When used as insert or bushing, possibility of thread stripping is eliminated. Firm holding is assured due to tight frictional lock produced by heat-treated Class 3 fit threads.

5. ALLENUTS can be set flush with or below containing parts resulting in streamlined contours without projections. Internal socket contributes to compact designs since no allowance is required for wrench clearance.

ALLENUTS of special heat-treated alloy steel are presently offered in sizes from No. 4 to $\frac{3}{8}$ ", either NC or NF threads. Sizes from $\frac{1}{16}$ " to 1" available soon. Order through your Allen industrial distributor.

Write for illustrated Bulletin N-51; also test samples of the new ALLENUT.



THE ALLEN MANUFACTURING COMPANY

HARTFORD 2, CONNECTICUT, U. S. A.

MARVEL *Metal Cutting* SAWS

Better Machines—Better Blades

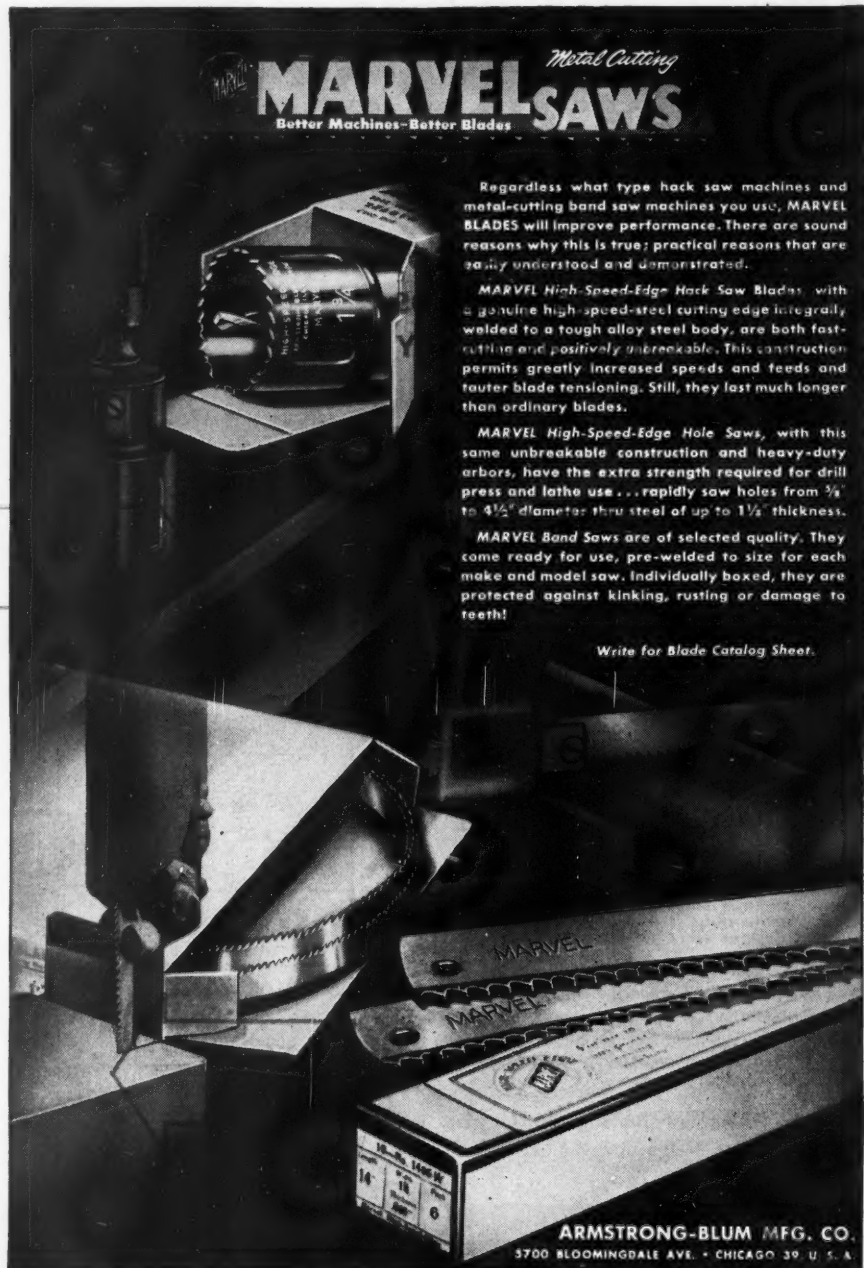
Regardless what type hack saw machines and metal-cutting band saw machines you use, MARVEL BLADES will improve performance. There are sound reasons why this is true; practical reasons that are easily understood and demonstrated.

MARVEL High-Speed-Edge Hack Saw Blades, with a genuine high-speed-steel cutting edge integrally welded to a tough alloy steel body, are both fast-cutting and positively unbreakable. This construction permits greatly increased speeds and feeds and tauter blade tensioning. Still, they last much longer than ordinary blades.

MARVEL High-Speed-Edge Hole Saws, with this same unbreakable construction and heavy-duty arbors, have the extra strength required for drill press and lathe use... rapidly saw holes from $\frac{3}{8}$ " to $4\frac{1}{2}$ " diameter thru steel of up to $1\frac{1}{2}$ " thickness.

MARVEL Band Saws are of selected quality. They come ready for use, pre-welded to size for each make and model saw. Individually boxed, they are protected against kinking, rusting or damage to teeth!

Write for Blade Catalog Sheet.

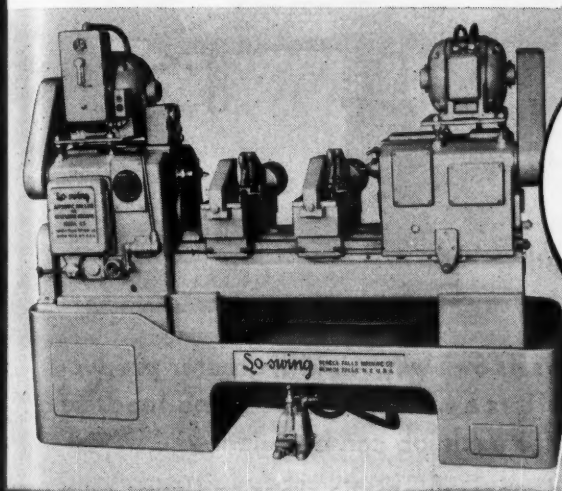


ARMSTRONG-BLUM MFG. CO.

3700 BLOOMINGDALE AVE. • CHICAGO 39, U. S. A.

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE *Lo-swing* PEOPLE" SENECA FALLS, NEW YORK



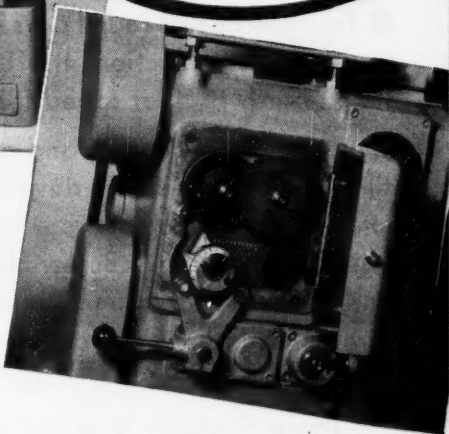
**REDUCE
YOUR
CENTERING
COSTS**

WITH A *Lo-swing* AUTOMATIC DRILLING and CENTERING MACHINE

● The Lo-swing Model "CS" has demonstrated a marked ability to cut costs on both mass production and short-run jobs. Both speeds and feeds can be quickly changed and automatic cycle time held to a strict minimum due to its exclusive HIGH SPEED, ADJUSTABLE RAPID TRAVERSE MECHANISM.

TWO INDEPENDENT, MOTOR-DRIVEN HEADS provide the correct spindle speeds for EACH head when different size drills or combination countersinks are used. Cam operated drilling spindles assure POSITIVE ACTION...cams will operate for any depth of cut within machine's capacity and DO NOT REQUIRE CHANGING. The Rapid Traverse Mechanism for both heads is controlled by cams which are PRESET TO A GRADUATED DIAL...much more efficient than the "set and try" method.

Standard, quick-acting, equalizing, air-operated vises are available and may be arranged to operate singly or



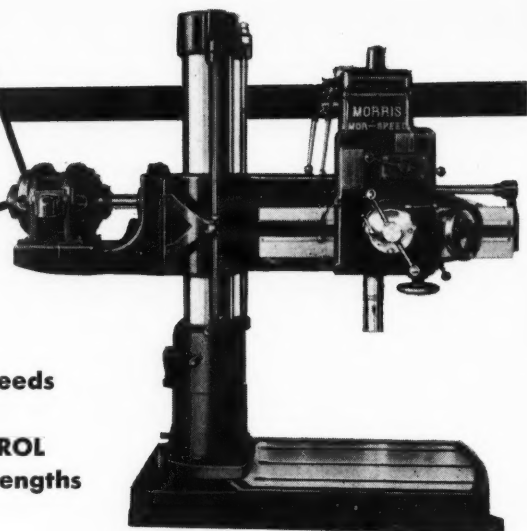
in pairs. Ample distance from the bed to the spindle provides sufficient room for special work-holding fixtures which are available as extra equipment. ELECTRIC MOTORS ARE THE STANDARD FOOT MOUNTING TYPE and may be furnished in sizes from 1 to 3 H.P.

Model "CS" is available in four standard sizes, 18", 42", 66" and 90" between drills. Write for full information on this new cost-cutting equipment.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.



**9" Column
9 and 12 Spindle Speeds
COMPLETE
CENTRALIZED CONTROL
Built in 3' and 4' Arm Lengths**



● The Mor-Speed radial pays its own way . . . with greater production and cost reduction. It offers a variety of speeds and feeds so that a more perfect speed for each job can be selected.

Centralized controls and more automatic stops and trips save time. Additional safety devices protect the workman, the machine and the work. Automatic and constant lubrication prevents damage and saves time. Better alloy steels, better hardened surfaces, and added anti-friction bearings at every vulnerable point throughout the entire machine enable it to take punishment undreamed of a few years ago.

These features coupled with greater strength, rigidity and balance make the MORRIS Mor-Speed Radial the most profitable radial drill investment today. Write for complete details.



Stainless Steel Pipe Lines

Right Off the Shelf!

Whether you use it to handle chemicals . . . foodstuffs . . . or dairy products . . . you'll find everything you need for that stainless pipe line right in Frasse warehouse stock.

Stainless pipe? Frasse stocks it in seamless or welded, standard or extra heavy—and in a complete range of sizes. You can choose the analysis, too—type 304, type 316 for severe corrosive conditions, or type 347 for high temperature use. All are on hand for immediate delivery.

Valves and fittings are equally handy. Frasse stocks stainless gate and globe valves, nipples, elbows, couplings, tees, unions—everything you need to hook up a new line, or replace a section.

It's convenient to work with the range and variety in Frasse stocks—and the quick delivery helps you get the job done. Whenever the layout calls for stainless—call Frasse. Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore

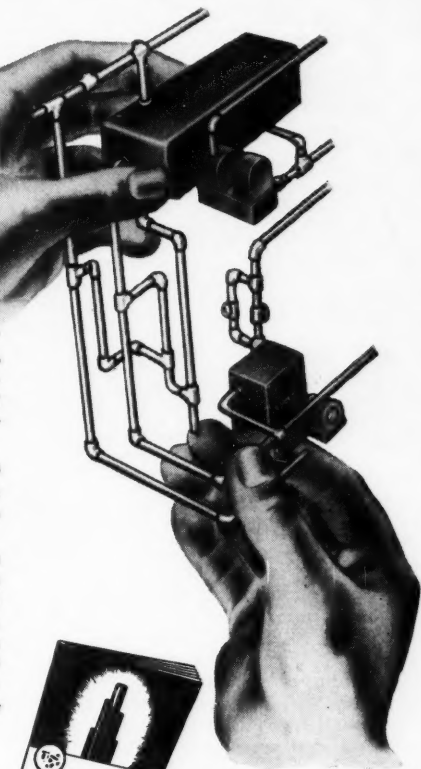
NEW! For Stainless Pipe and Tube Users!

This new 24-page manual is brimful of useful data on stainless steel tubular products. Includes type characteristics, physical properties, fabricating data, tolerances, standard finishes, corrosion resistance, and similar essential information. Invaluable for reference if you're working with stainless tube or pipe. Send for your free copy today.

FRASSE

... for

Stainless Tubing, Pipe, Valves and Fittings



Peter A. Frasse and Co., Inc.
17 Grand Street, New York 13, N. Y.

Please send me a complimentary copy of your new stainless tube and pipe manual.

Name.....Title.....

Firm.....

Address.....

64M

more Precision Stampings



A partial view of the many PRESS-RITE Punch Presses used by a prominent mid-western control manufacturer.

Thousands upon thousands of accurate stampings are punched out daily by PRESS-RITE PRESSES. Users know these presses are carefully engineered, ruggedly built, safe and thoroughly dependable. With the safety features on the new 1948 PRESS-RITE PRESSES there is added protection for the operator . . . the dies . . . and the presses. Check the new non-repeat clutch mechanism today! Choose from 5 ton, 10 ton, 12 ton, 18 ton, or 30 ton models according to your requirements.

See your dealer about PRESS-RITE PRESSES today or write us,
Dept. M-98 for details.



With
PRESS-RITE
OPEN BACK, INCLINABLE
PUNCH PRESSES

Sales Service Machine Tool Co.



PRESS
RITE
PRESSES



SHAPE
RITE
SHAPERS



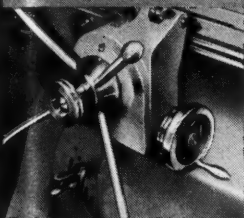
KELLER
POWER
HACK SAWS

2363 UNIVERSITY AVENUE
ST. PAUL 4, MINNESOTA

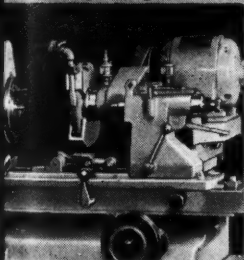
**For TOOL ROOM
and
FINE PRODUCTION**
ON PARTS REQUIRING
**INTERNAL, EXTERNAL or
SHOULDER GRINDING**

Now You **CAN ACHIEVE
A GREATER VARIETY OF
PRECISION OPERATIONS**

The Rivett No. 112 Universal Grinder can be quickly set up for straight, taper, bevel or straight and bevel grinding on one or many pieces. Interchangeable brackets are selectively mounted on the cross slide for internal and external operations. Power driven-table stroke can be controlled for exact positioning on internal and external shoulder grinding. Extreme simplicity of design assures easy and efficient operation by even a lay machinist. Write for Bulletin No. 112.



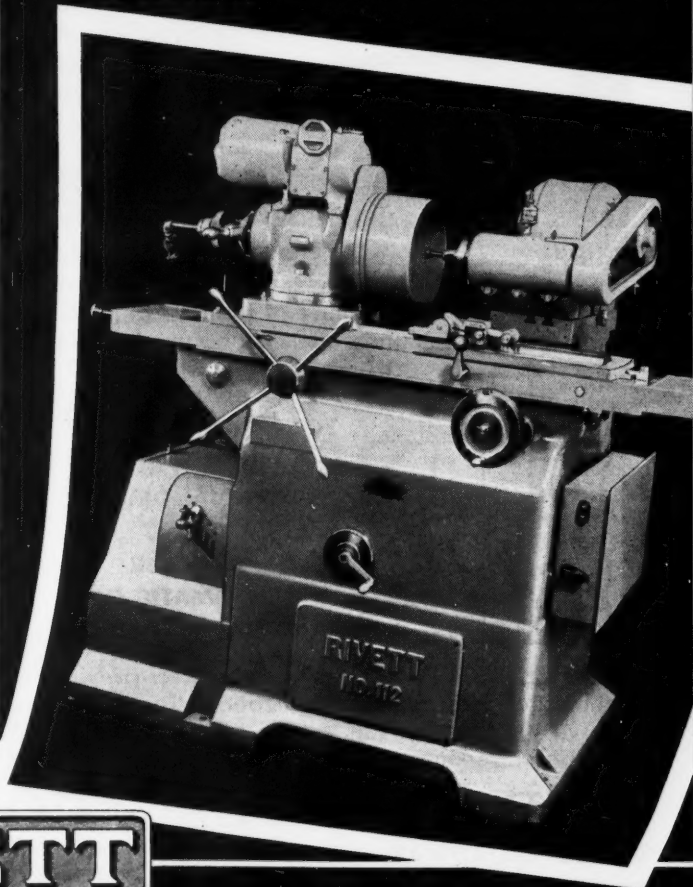
Fine table feed with micrometer stop for shoulder and face grinding.



Spindle, tail stock and dead center drive for external grinding.

SPECIFICATIONS

Grinding cap., hole dia. $\frac{1}{4}$ " to 8"
Grinding cap., outside dia. up to 8"
Automatic table travel $\frac{1}{8}$ " to 8"
Table speeds..... 18 selective
Swing over table..... 14"
Workhead swivel..... 90°
Table swivel..... 5°
Cross slide swivel..... 90°
Collet capacity..... 1"
Grinding spindle speeds:
Internal..... 5000 to 25000 r.p.m.
External..... 3300 r.p.m.
Net weight with motors 3700 lbs.



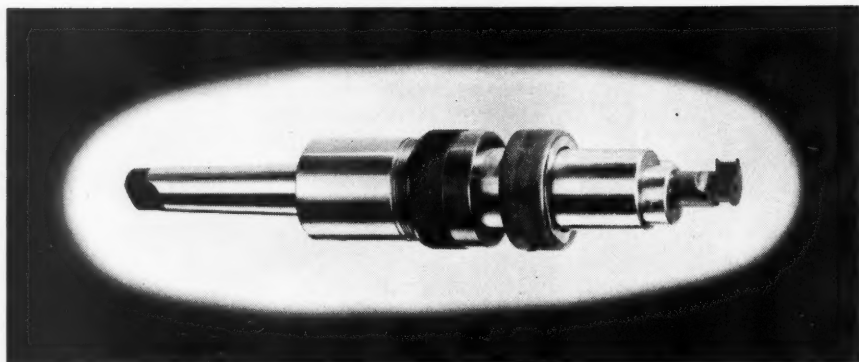
RIVETT

RIVETT LATHE & GRINDER INC

RECESSING TOOLS

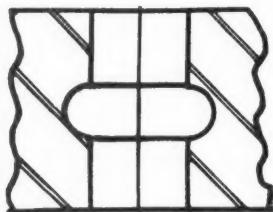
AN OLD NAME . . . A NEW TOOL

by MAXWELL

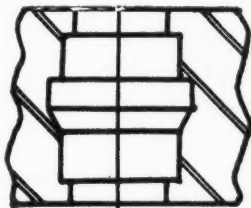


THIS is another Max-WELL-Made tool. It is designed especially to fit any and all jig and fixture setups, and is available in three sizes which have working range of from $\frac{1}{2}$ to 2-3/16 inches. Tools operate into standard bushings and can be used on any automatic or manual spindle.

THERE is a Maxwell Recessing Tool for your job whether you do the work with a



**DRILL PRESS
RADIAL DRILL
TURRET
CHUCKER
AUTOMATIC OR
SPECIAL SPINDLES**



INTERCHANGEABLE shanks and cutters provide this reasonably priced tool with wide range of application. Tools are available for immediate delivery. Write for full details or send your specifications and let our engineers recommend the proper Max-WELL-Made Recessing Tool.

THE MAXWELL COMPANY

9325 BROADWAY



BEDFORD, OHIO

Save Time, Money and Manpower...

HAVE COMPRESSED AIR

Where you want it, When you want it.

QUICK IN



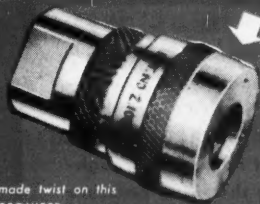
One simple push locks in adapter, starts air flowing automatically.

QUICK OUT



A slight twist disconnects adapter. Air shuts off immediately and automatically.

THIS MAKES IT SAFER



A man-made twist on this sleeve **REQUIRED** to uncouple—can't uncouple accidentally.

Now you can have compressed air at your fingertips, always, with Schrader two-piece, quick connecting air couplers, conveniently placed along walls, benches or posts. Schrader Quick-Acting Adapters snap into Check-Units attached to the main air line. Any pneumatic tool can be carried to its point of use and be put to work immediately. Hose need never be dangerously and wastefully draped over benches and machines!

Get full information on these time and step saving devices now by checking off "Air Line Couplers" on the coupon below and dropping it in the mail today.



FREE

Get your copy of this information-packed 8 Page Booklet describing Schrader Air Control Products.

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PRODUCTS
CONTROL THE AIR

A. SCHRADER'S SON, 474 Vanderbilt Avenue
Brooklyn 17, N. Y.
Division of Scovill Manufacturing Company, Incorporated

Please send me your **FREE BULLETIN** and more information about the products I have checked in circles below.

NAME

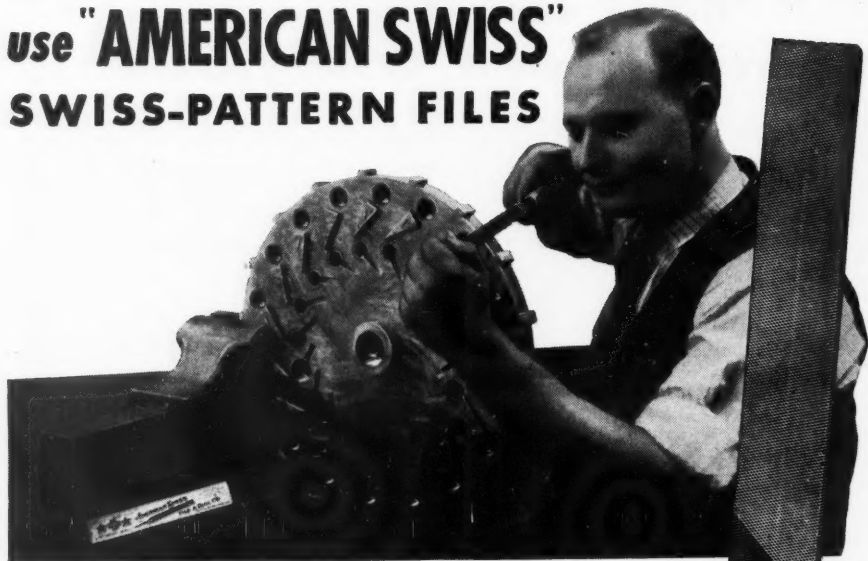
COMPANY

ADDRESS CITY STATE

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| <input type="checkbox"/> Air Cylinders | <input type="checkbox"/> Air Line Couplers |
| <input type="checkbox"/> Air Valves | <input type="checkbox"/> Air Hoses & Fittings |
| <input type="checkbox"/> Press Controls | <input type="checkbox"/> Hose Reels |
| <input type="checkbox"/> Air Ejection Sets | <input type="checkbox"/> Hydraulic Gauges |
| <input type="checkbox"/> Blow Guns | <input type="checkbox"/> Air Pressure Regulators |

Have You a Finishing Filing Job?

use "AMERICAN SWISS"
SWISS-PATTERN FILES



Those final finishing touches can make or break a job—they need the finest of files as well as a skilled craftsman. With "American Swiss" Swiss-Pattern File, you can always be sure of clean sharp teeth that remove just the right amount of metal from just the right places. You can be sure, too, of the uniformity of hardness throughout the length of every file that helps you judge the filing pressure to be used. You're always safe with "American Swiss."

Buy From Our Authorized Distributor.

AMERICAN SWISS FILE & TOOL CO.

410 Trumbull Street, Elizabeth 1, N. J.

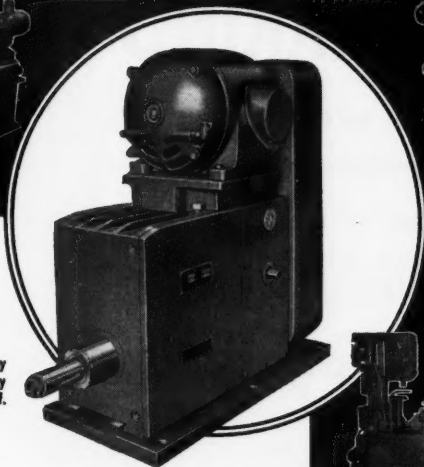
ASK FOR THEM BY THIS NAME

American Swiss

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SWISS PATTERN FILES

THE *Avey* CAM FEED UNIT



Write us — Your inquiry
given prompt attention by
our sales engineering staff.

Designed for universal applications. Illustrated are *Avey* machines equipped with Cam Feed Units to answer the demand for high production equipment.

This simple unit gives high production at a lower cost. When used in multiples to complete operations, no re-location of parts is necessary, thus producing more accurate work.

Semi-skilled operators will deliver high production accurately, efficiently, with a minimum of supervision.

THE AVEY DRILLING MACHINE CO. • CINCINNATI • OHIO

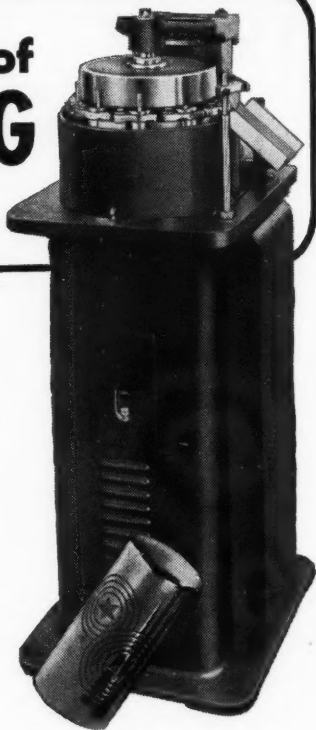




One kind of **MARKING**

this machine won't do

But it does mark the case of the lipstick used by the young lady who left her mark. And more important to you is the fact that this addition to the Noblewest line can be tooled for marking a large variety of products in metal, plastic, hard rubber, wood, etc. Employs the famed Noblewest roll marking process. The inscription (including the delicate decorative design) is permanently rolled in—lasts as long as the product itself. You, too, can mark your products faster, better, cheaper with Noblewest Production Marking Equipment. Write Noble & Westbrook Manufacturing Co., 25 Westbrook St., East Hartford 8, Conn.



**Illustrated
Model No. 279**

**MARK IT
BEST WITH**

**NOBLEWEST
IMPROVED
MARKING
DEVICES**

NOBLEWEST

EQUIPMENT FOR MARKING • GRADUATING • EMBOSSING • NUMBERING

exceptional tool life....

roughing and finishing

with
BARBER-COLMAN
CARBIDE TIPPED
REAMERS

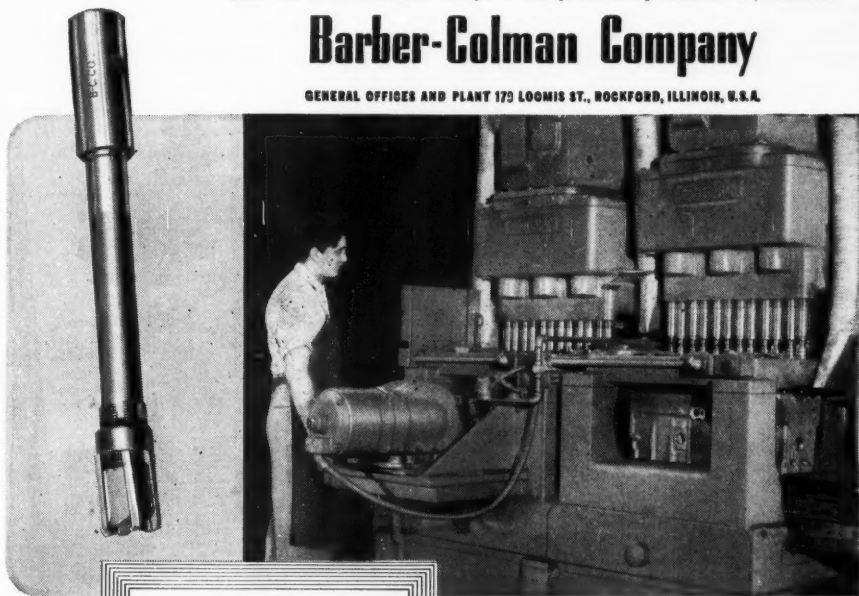
Vibration and end-play may vary from spindle to spindle on multiple reaming operations. Therefore, reamer design is even more important in controlling identical holes at each station. Barber-Colman Inserted Blade Reamers with carbide tips, used on this operation, are built with floating holders and magic-chuck drives. This permits reamers to seat themselves independently of machine conditions and produces accurate, straight, round holes.

Barber-Colman Reamers are made with irregularly-spaced blades to give smooth cutting action and finely finished work. This feature eliminates welts frequently caused by uniform spacing. Long tool life is assured with the rigid mounting provided by wedges and an adjusting collar which prevent any blade movement during reaming.

Consult Barber-Colman Reamer Engineers on your reaming problems. Quotations will be furnished on receipt of blue-prints and production requirements.

Barber-Colman Company

GENERAL OFFICES AND PLANT 179 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



JOB RECORD

Operation — Ream valve tappet holes

Material — Gray cast iron

	<u>Roughing</u>	<u>Finishing</u>
Feed —	8.32" per min.	16.6" per min.
Speed —	81 SFM	36 SFM
Tool Life —	4000-5000 holes per sharp- ening	16000 - 18000 holes per sharp- ening

Tolerance — Size .990"/.991"



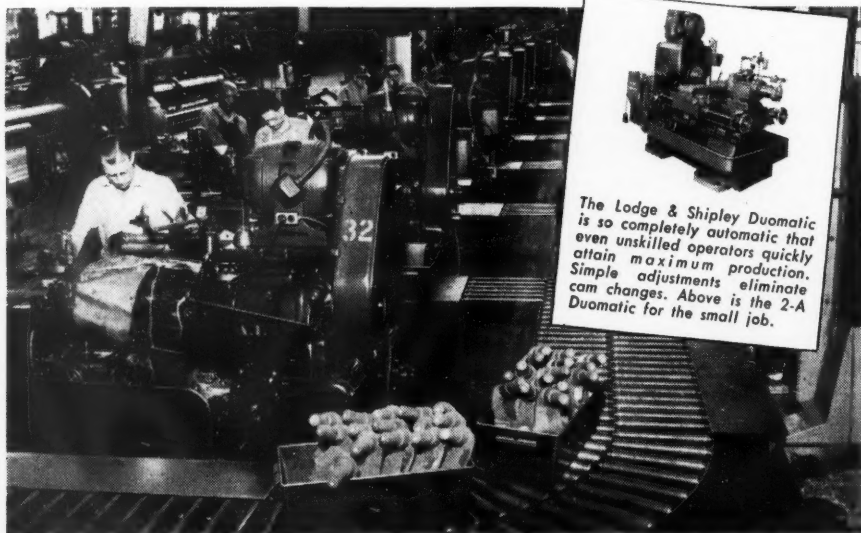
When PRODUCTION is first consideration LODGE & SHIPLEY DUOMATICS rank first

Quality tools to withstand the terrific wear of oil field work are the product of the Reed Roller Bit Co., Houston, Texas. To machine thousands of cross lugs for Reed Rock Bits (drilling tools), a line of Lodge & Shipley 3-A Duomatics (automatic lathes) were installed.

These parts are forged steel of maximum toughness. Duomatics turn them

out in an endless stream. . . automatically. Operators just load rough parts, pull the lever, then unload the machined parts.

If you have job repetitive lathe work . . . 50 parts, 500 parts or more . . . you will find many advantages in a Duomatic. Write for Bulletin No. 634 for 3-A Duomatics and Bulletin No. 635 for 2-A Duomatics.



The Lodge & Shipley Duomatic is so completely automatic that even unskilled operators quickly attain maximum production. Simple adjustments eliminate cam changes. Above is the 2-A Duomatic for the small job.

The machine shop of the Reed Roller Bit Co. presents the latest in tooling and layout. Shown here is a line of Lodge & Shipley Duomatic Lathes served by roller conveyors.

THE **Lodge & Shipley** COMPANY

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION • 3055 COLERAIN

SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

"Wanta make something out of it ?"...

... Get a

Bodine



YOU
CAN
HAVE

1
MILLING, DRILLING
TAPPING, SCREW
INSERTING—*automatically*
IN ONE MACHINE

3
HOPPER OR MANUAL
FEED—AUTOMATIC
OR MANUAL EJECT

2
SPINDLES LOCATED FOR
VERTICAL, HORIZONTAL,
DIAGONAL OR INVERTED
OPERATION—around the dial

4
HORIZONTAL INDEXING
DIAL WITH *automatic*
CLAMPING FIXTURES

If you require repetitive production of small parts check with BODINE ENGINEERS. Six sizes, tooled to your specific job... for high speed, low cost processing.

"You can't meet tomorrow's competition with yesterday's machine tools."

SEND FOR BULLETIN MM

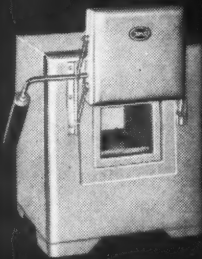
THE
Bodine
CORPORATION
BRIDGEPORT, CONNECTICUT

AUTOMATIC DIAL TYPE DRILLING, MILLING,
TAPPING AND SCREW INSERTING MACHINES

78048

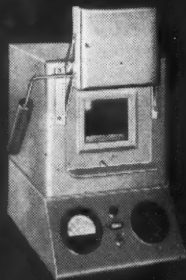


SERIES 1700—Two models: with chamber sizes 8½" W, 7½" H, 13½" D or 8½" W, 7½" H, 18" D. Both for 230-volt operation. Prices—\$250.00 to \$385.00 complete with controls.



SERIES 1600

—Two models: with chamber sizes 5" W, 4½" H, 9" D and 5" W, 4½" H, 13½" D. 115 or 230-volt operation. Prices—\$140.00 to \$260.00 complete with controls.



SERIES 1500

—Two models: with chamber sizes 4" W, 3½" H, 4½" D and 4" W, 3½" H, 9" D. 115 or 230-volt operation. Prices—\$87.50 to \$107.50 complete with stepless control.

New Improved

TEMCO

ELECTRIC FURNACES

**FOR HEAT TREATING TOOLS, DIES, PARTS
AND GENERAL LABORATORY WORK**

Do your own heat treating... right in your own plant or shop... save time and costs, eliminate sending work "outside". Investigate this rugged *entirely new* TEMCO line today... welded steel construction, heavy dual insulation! Fast-heating and can be operated continuously up to 1650° F., intermittently to 1900° F. Use for hardening and tempering of tools, dies, parts and small unit production. Ideal, too, for lab testing and process control. Write today for data and your nearest dealer's name.

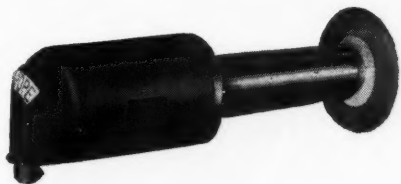
**THERMO ELECTRIC
MANUFACTURING CO.**

488-9 W. Locust St., Dubuque, Iowa

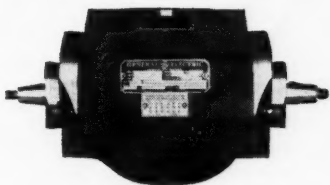
POPE



GRINDER SPINDLES AT A GLANCE



P-327 Pope Sealed Package Spindle for 6" x 18" Surface Grinders, with a full 1 HP, 3450 RPM totally enclosed motor; for use with grinding wheels up to 8" O. D., 1 1/4" face, 1 1/4" hole.



P-1004 Pope Direct Motorized Tool Grinder Spindle with 1 HP, 3450 RPM totally enclosed motor; for grinding wheels up to 8" O. D., 1 1/4" face, 1 1/4" hole.



P-2463 Pope Heavy Duty Vee Belt Driven Cartridge Type Spindle in mounting bracket, for grinding wheels up to 4" O. D. at 6000 RPM, 2" face with 1" hole.



P-2500 Pope Heavy Duty Motorized Spindles in a variety of sizes from 1/4 HP to 20 HP and from 900 to 3600 RPM.



P-666 Pope Heavy Duty Vee Belt Driven Grinding Machine Wheel Head Spindle; for grinding wheels up to 28" O. D., 1 1/2" face, 8" hole at 750 RPM Maximum speed 4000 RPM.

Here is a representative showing of POPE Precision Grinding Spindles. Others are available in a great variety of sizes and styles. Each assures:

1. Constant Production of Uniformly Good Finished Surfaces.
2. Cool Operation At High Speeds Over Long Periods.
3. Sealed Lubrication Performance — no oiling or greasing, nothing to renew, replace or adjust throughout the entire life of the bearings.

NO. 52

POPE

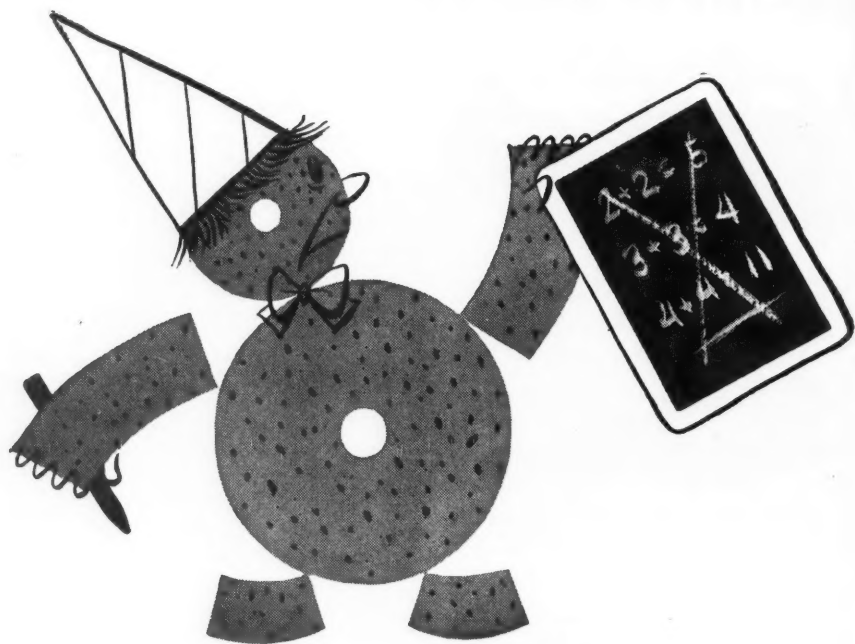
TRADE MARK REG. U.S. PAT. OFF.

POPE MACHINERY CORPORATION

ESTABLISHED 1920

261 RIVER STREET • HAVERHILL, MASSACHUSETTS
BUILDERS OF PRECISION SPINDLES

When multiplication is
important



use

ROBERTSON
Grinding Wheels

Worried about production and increased costs? Have you examined your method of cost analysis? Are you designing products that can be ground instead of machined? Are you wasting time on your grinding operations?

Most important, don't neglect to give careful consideration to the selection of your grinding wheels. You'll find, in most cases, your best bet will be a Robertson Wheel. There's nothing superior to a Robertson for long wheel-life, fast, accurate production, and finish.

You can count on results like this from Robertson Grinding Wheels: A large manufacturing plant was grinding cotterspins made from drop forgings. Taking off 1/16" stock on a plunge cut, it was getting only 25 pieces per wheel-dressing. When a Robertson sales-engineer was called in, he studied the problem and recommended a Robertson SA 549-QV wheel. Immediately production rose to 125 pieces per wheel-dressing—an increase of 400 percent!

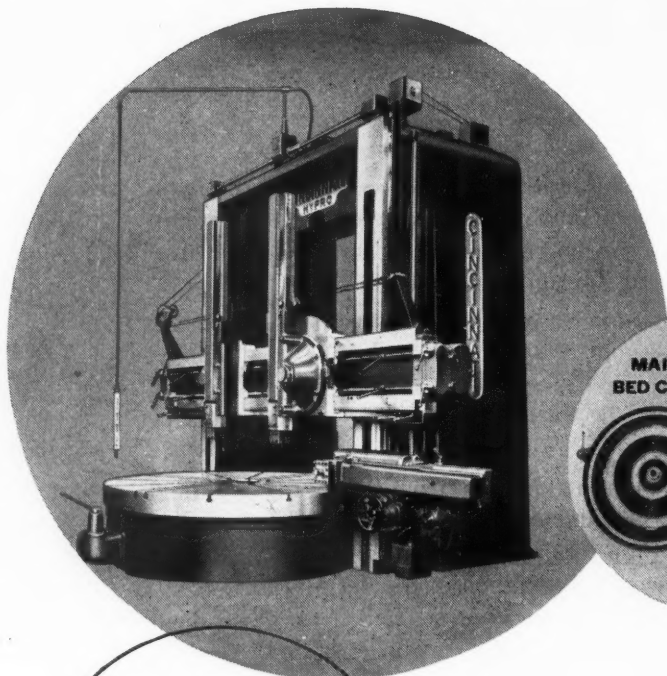
A sharp increase in production is not worth shouting about when it happens only once. Other users, however, are meeting with the same results, as: "Cuts grinding time in half" . . . "Production tripled" . . . "Reduces tool-grinding costs 10 percent to 20 percent." For all grinding operations—even the toughest ones—you'll get top results from Robertson vitrified-bonded or resin-bonded grinding wheels. Blueprint your problem, and let us recommend a wheel for your particular job.

ROBERTSON MANUFACTURING COMPANY

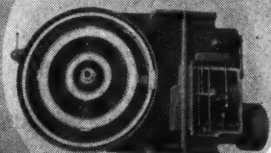
TRENTON 5, NEW JERSEY

Resin-Bonded and Vitrified-Bonded Grinding Wheels • Mounted Wheels • Segments





**MAIN DRIVE AND
BED CONSTRUCTION**



4 MORE GOOD
REASONS FOR THEIR
AMAZING
PERFORMANCE

CINCINNATI
HYPRO Boring Mill
10-FOOT — 12-FOOT

1. One piece speed box and bed construction, providing rigidity and preventing misalignment of shafts
2. Hardened steel forged gears mounted on multiple splined shafts running in anti-friction bearings
3. Anti-friction bearing table mounting with 3 load carrying tracks; outside track nearly full diameter of table
4. Automatic pressure lubrication to all units and parts, interlocked with main drive motor

THE CINCINNATI HYPRO PLANER COMPANY
PLANERS · BORING MILLS · PLANER TYPE MILLERS
CINCINNATI, OHIO



CUTS GRINDING COSTS 30%

THE load on the compressor in this fabricating shop had increased so much the pressure at the tools was sometimes as low as 40 lbs. with consequent loss in production. A new compressor would have cost \$5000. The Rotor Application Engineer suggested High Cycle Grinders to relieve the load on the compressor, and they were purchased with the following results:

Cuts grinding time 30% because of

faster wheel speeds, saving enough to pay for installation in 11 months.

Saves \$3800 on first cost. Frequency converter cost \$1200, compared to \$5000 for air equipment.

Reduces power cost 75%. Air system would have required 60 hp. High Cycle requires 15 hp.

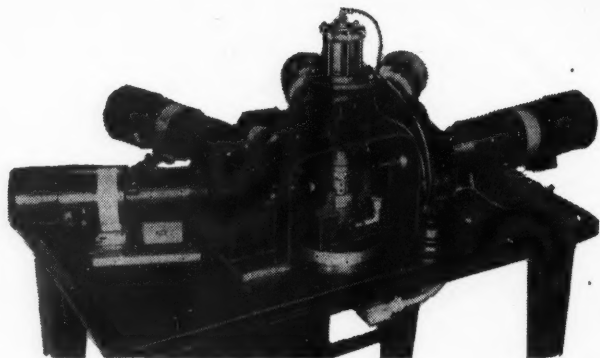
Shall we study your production for similar benefits?

HI-CYCLE O'TOOL

AIR

THE ROTOR TOOL CO.
CLEVELAND, OHIO

HIGH
CYCLE



A Difficult Drilling Operation Made Simple

THE above set-up for drilling 20 holes at three levels through a 9/16" wall of a cast-iron bushing, is an example of how Govro-Nelson Automatic Drilling Units can be used to simplify a complex drilling operation.

With the 5 Govro-Nelson Units so arranged that two are on the top level, two on the bottom level, and one on the center level, 5 holes are drilled at once. The machine indexes 4 times to drill the 20 holes, completing the cycle in 72 seconds per piece.

If you have a multiple drilling operation that you would like to speed up, tell us your problem. We shall be pleased to quote on drilling units only or on the complete machine. Literature sent upon request.

WRITE FOR
Literature

GOVRO-NELSON CO.

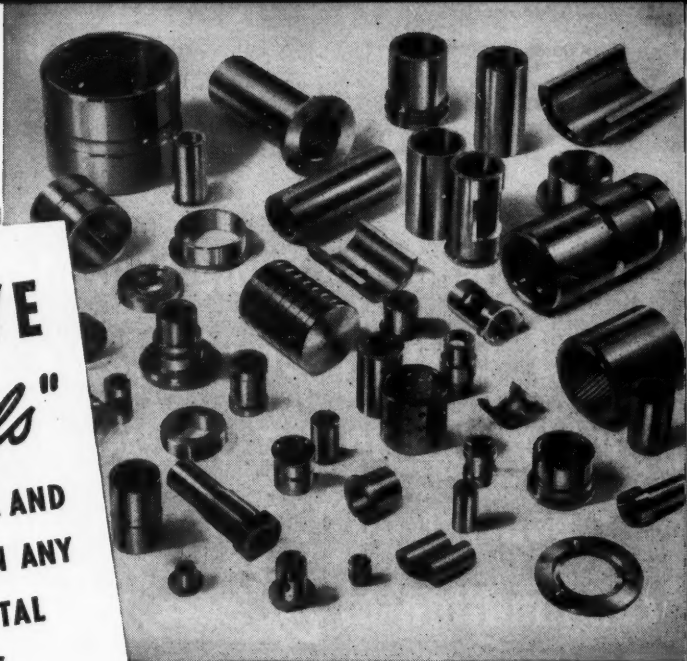
*Machinists of Precision Parts
for 25 Years*

1933 Antoinette, Detroit 8, Mich.

Automatic **DRILLING UNIT**

BUCKEYE *"Specials"*

IN ANY I.D., O.D. AND
LENGTH...AND IN ANY
DESIRED METAL
ANALYSIS



Slotted, Split, Drilled or Flanged Exactly to Your Blue-Print Requirement

● Our 1038 sizes of ready-to-use stock bearings are the time-proved answer to most industrial bearing needs. For others, these "specials"—conforming exactly to customers' blue-print—find wide use on machines and machinery of all kinds. Manufactured from selected materials under our exacting controls, each is a quality product,—free from porosity and accurately dimensioned within the required limits, assuring speedy, easy assembly, and a maximum of long, efficient, satisfactory service. Let us quote on your "special to blue-print" requirements.

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CLEVELAND 3, OHIO

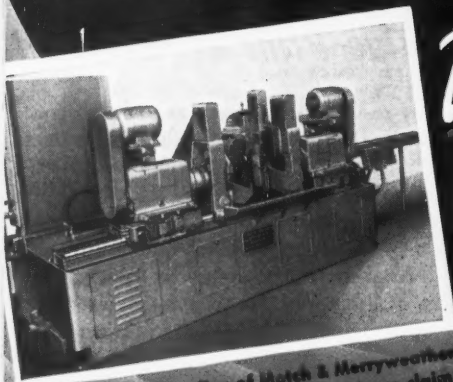


BRONZE SLEEVE BEARINGS • STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT

*Triple-
Chip*
METHOD

Using the Triple-Chip Method
of Circular Sawing, we hereby
undertake to cut your metal (ferrous
or non-ferrous), to length, giving you a
combination of *Speed, Accuracy and
Low Cost*—not equalled by any other
procedure.

*Will You Accept
Our Challenge?*



The new, complete line of Motch & Merryweather Transfer
Machines not only will prove the above claim, but will
introduce you to a startlingly new and better method of
sawing to length and
performing double end
finishing operations.

Only
M & M builds
ALL 3:
CIRCULAR SAW
SAW BLADE
BLADE GRINDER

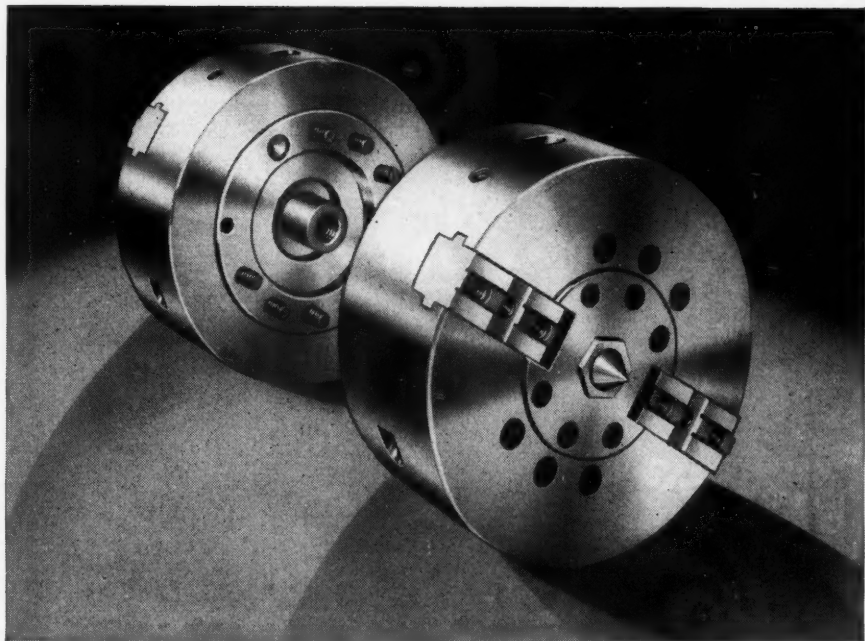
THE MOTCH & MERRYWEATHER MACHINERY CO.
CANTON BUILDING
CLEVELAND 13, OHIO

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Front & Rear Views of Series 23100-A Compensating Heavy-Duty Chuck

Things were going to the "DOGS"

... until Skinner brought out the new Compensating Power Chuck. This new power chuck not only replaces "dogs" on mass production lathe work, but does such jobs more easily, quickly and accurately. The unique Skinner design allows $\frac{1}{8}$ " compensation, per jaw, for positive gripping of rough stock with normal variations in size and in centering.

The chuck body is a one-piece steel forging. The center is hardened and ground high speed steel, and fits into a precision ground Morse taper hole in the center plate. The husky center plate

is also hardened and ground and is bolted to the chuck body with six sturdy screws. This construction, plus selected alloy steels, properly heat-treated for jaws and all internal parts, is your assurance of maximum accuracy and output for jobs requiring heavy cuts at high speeds with carbide tooling.

The Series 23100-A Compensating Power Chuck saves production time and costs while reducing operator fatigue. It will pay to investigate this new Skinner production tool which has already gained wide acceptance in the mass production field.

Complete details on Skinner Power Chucks, rotating and non-rotating air cylinders, valves, filters and all other Skinner chucking and vise equipment are contained in Catalog No. 60. Write for your free copy today.

The Skinner Chuck Co.
340 CHURCH STREET, NEW BRITAIN, CONN.

**Skinner
Chucks**



HAND & POWER OPERATED MACHINE CHUCKS - AIR CHUCK EQUIPMENT - FACE PLATE JAWS - MACHINE VISES

INTERNATIONAL HARVESTER PUTS...

EMPHASIS
ON
QUALITY

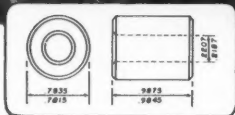
WITH GREENLEE SIX-SPINDLE AUTOMATICS

CONTROL SYSTEM SAVES TIME FOR FOREMAN

A system of quality control and a little teamwork between the inspection and screw machine departments of International Harvester Co., Milwaukee, has elevated production standards and lowered scrap losses in the manufacture of parts for Diesel Engine Injection Pumps.

In the screw machine department pictured above, where four Greenlee 6-Spindle Automatics are at work, the inspector makes an hourly spot-check of parts produced by each machine. It is an important part of a quality control system which aids operators, helps maintain standards, and at the same time allows the foreman more time to handle set-up, tooling, and scheduling problems.

Fitting into this production plan, Greenlee Automatics are called upon to produce parts with a good degree of accuracy and handle both short and long run jobs economically.



TYPICAL JOB:

The above part for an International Diesel Engine Injection Pump is produced on a 1" Greenlee "6". The part, a nozzle valve guide, is completed as shown with a tolerance of .002" on the hole diameter. A later operation grinds the hole to .0005" tolerance. An accelerated reaming attachment is used as shown in the 6th or cutting position for the finishing operation of the center hole. The accelerated action of the attachment permits its use on the Greenlee in four positions, including cut-off.



WRITE FOR NEW LITERATURE describing quick-change features and the new interchangeable lead-screw threading feed for the Greenlee Automatic. Ask also for details on the 16 mm. sound movie describing the building of a Greenlee "6".



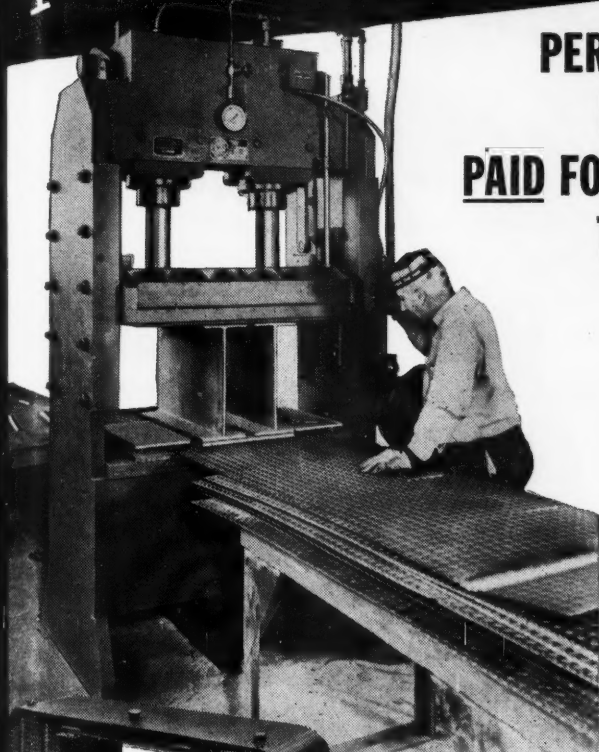
GREENLEE BROS. & CO.
1889 MASON AVENUE
ROCKFORD, ILLINOIS

DETROIT OFFICE:
504 Curtis Bldg., Detroit 2, Mich.

MULTIPLE SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

"I wouldn't sell it for Twice what it Cost

**PERKINS WELDING SAYS
KRW 100-TON PRESS
PAID FOR ITSELF IN 60 DAYS
THRU MATERIAL AND
LABOR SAVINGS**



PERKINS WELDED
SADDLE TANK

LET US KNOW YOUR NEEDS
... we are fully equipped to engineer our equipment to handle your work. In the majority of cases, we can make delivery in a fraction

of the time required for other type presses. Let us hear from you.

ALL TYPES OF DIES. We are equipped to engineer and build dies to meet your specifications. All we need is available technical data, blue prints and, where practical, a sample piece of work. We'll quote prices and delivery date.

**THE STANDARD KRW 100-TON
HYDRAULIC PRESS IS ONLY \$4850 FOB***
NAME YOUR NEEDS...MAIL COUPON TODAY

*Prices subject to change without notice.

K·R·WILSON

BIG TRAILER TRUCKS eat up a lot of gas on an average run. For that reason most are equipped with big "saddle tanks" which hold 125 gallons or more...thus eliminating frequent stops to fuel up. Perkins Welding makes these super tanks out of 1/8 inch steel. Until recently, they welded angle stiffeners onto the tanks for extra strength. A KRW Engineer showed them how they could save considerably by forming stiffening ribs on a KRW 100-Ton Press. The result... savings so great that "it paid for itself in 60 days."

"You don't need a sledge to drive a tack" For the same reason...on a big percentage of forming, blanking and stamping work... you don't need large, heavy-tonnage presses with their high initial and operating costs.

Production records, in a variety of industries, show that KRW Presses greatly reduce costs. First investment is very low, operating costs are still lower. In one instance the purchase price of a KRW Stamping Press was less than the foundation cost for heavier equipment.

KRW Presses are highly flexible...they can be built with platen sizes up to 36" 60", and can be gap, open or closed end in type. Tonnage pressures can vary from 25 to 100-tons. Because they are hydraulically operated and not mechanically driven, they are quiet and vibrationless in operation. They are equipped with automatic safety and operational controls. Platens can be stopped at any point in their travel.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

16

Please quote me prices and information on following types of KRW Presses. Please check. Gap ☐ Open End ☐ Closed End

Tonnage Req. Die Dimensions

Name

Address

Woodworth Engineered Products

PRECISION GAGES

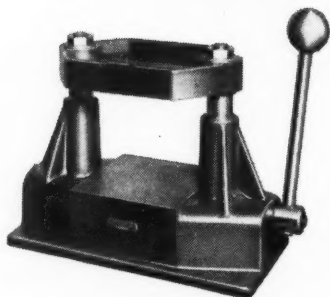


Woodworth manufactures a complete line of thread ring and thread plug as well as cylindrical plug and ring gages. Also produce special gages to customer blue-prints.

PRECISION PARTS



N. A. Woodworth engineering gives you plus value in precision parts. Production men with "know how" combined with well equipped plant are pace setters in aircraft engine and radar assembly fields.

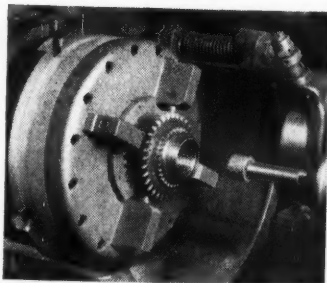


CONE-LOK JIGS

Woodworth Cone-Lok Jigs are noted for their mechanical simplicity and "life-time" construction.

DIAPHRAGM CHUCKS

Chucks engineered and built by Woodworth guarantees the ultimate in precision gear chucking.

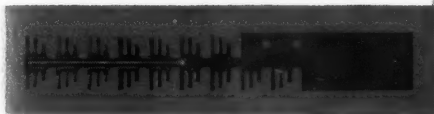


ACCURACY YOU CAN TRUST

WOODWORTH

N. A. WOODWORTH CO., 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN
COMPLETE LINE OF PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS

**7,200 Pieces per hour
from 1 $\frac{9}{16}$ " x .042"
C.R.S. Coil Stock using ...**



DANLY Precision DIE SET

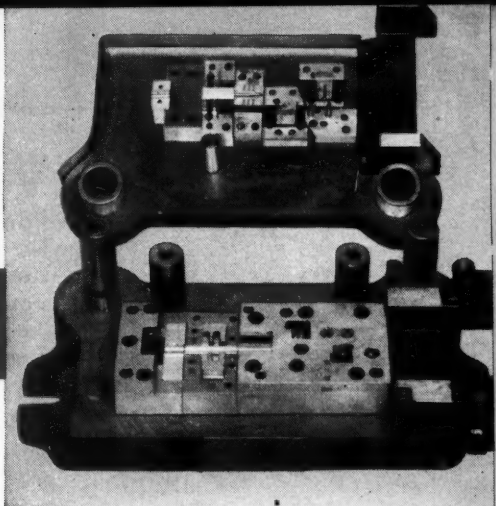


Photo courtesy of Federal Tool Corporation, Chicago

Tolerance of .001" held on 10-station progressive die

Here's another example of how Danly Precision Die Sets maintain close tolerance punch and die relationship on high production work.

The part illustrated, a nut chopper cutter, is produced on a 10-station progressive die at a rate of 7,200 pieces per hour. An average of 100,000 pieces are obtained between grinds. Tolerance of .001" between stations is maintained.

**save
time**

USE DANLY NATION-WIDE
DIE SET ASSEMBLY SERVICE

Assembly plants (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to your specifications.

- * Chicago 50, 2100 S. 52nd Ave.
- * Cleveland 14, 1550-E. 33rd St.
- * Dayton 2, 990 E. Monument Ave.
- * Detroit 16, 1549 Temple Ave.
- * Grand Rapids, 113 Michigan Ave., N.W.
- * Long Island City 1, 47-28 37th St.
- * Los Angeles 54, Ducommun Metals & Supply Co., 4890 S. Alameda
- * Milwaukee 2, 111 E. Wisconsin Ave.
- * Philadelphia 44, 18 W. Chelton Ave.
- * Rochester 4, 16 Commercial St.

To date the same original Danly Die Set has held the tolerance required for a total of 1,500,000 pieces, and under normal operating conditions, will continue to give many more hours of profitable service.

SEQUENCE OF OPERATIONS—The roll stock is fed automatically through the following sequence of operations: (1) Pierce and notch right edge, (2) pilot, (3) notch left edge, (4) rough form center, (5) finish form center, (6) idle, (7) twist, (8) idle, (9) idle, (10) cut off.

HELPFUL ENGINEERING SERVICE—For helpful engineering service on Die Sets of any size, standard or special, for any type of press operation, consult Danly without obligation.

write for this *free* bulletin

Illustrates how you may use Danly's special machining and welding service to save additional time and money.



DANLY

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS



25 YEARS OF DEPENDABLE SERVICE
TO THE STAMPING INDUSTRY

NOW

is the **TIME—**

WITH industry seething with activity . . . with multi-billion appropriations speeding through Congress . . . with an all time high in employment and demand still exceeding supply . . . get ready for even higher production.



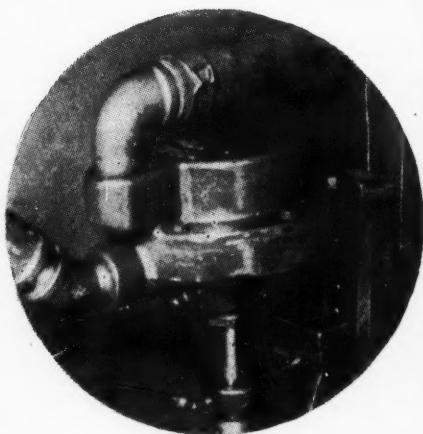
COOLANT PUMPS

Centrifugal

Cutting tools and work surfaces are held to proper workable temperatures . . . coolants hit the right spots uniformly and constantly.

FULFLO COOLANT PUMPS are available with motor, direct or belt drives.

Pipe sizes: $\frac{3}{8}$ " to $1\frac{1}{2}$ ".



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Write on your letterhead for
FULFLO MECHANICAL DATA BOOK

Specialties Co., Inc.
BLANCHESTER, OHIO



JIG GRINDING

with the

Vulcanaire

WHEN jig grinding is needed you can have it quickly and economically with the VULCANAIRE. This precision attachment can be placed in the spindle of your jig borer (or other machine tools) and you can accurately locate and finish grind holes in hardened steel to "tenths" at controlled speeds ranging up to

65,000 RPM. The VULCANAIRE is a precision instrument that takes the high cost out of jig grinding.

Write for detailed literature—or for a quotation, please advise the name and type of machine on which you would like to use the VULCANAIRE.

VULCAN TOOL COMPANY • DAYTON 10 • OHIO

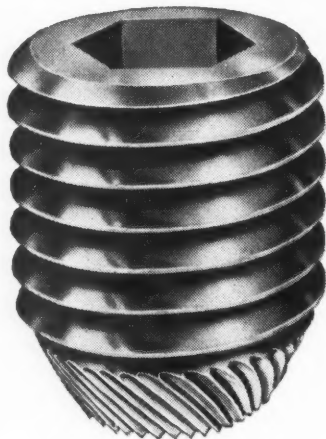
THESE SELF-LOCKERS WON'T SHAKE LOOSE

UNBRAKO

Reg. U. S. Pat. Off.

(A)

Pat'd and
Pat's Pend.



(B)



Knurling of Socket
Screws originated with
"Unbrako" in 1934.

They're KNURLED!

(A) The Knurling of this "Unbrako" Socket Set Screw, as shown, swages the threads, so it becomes a most excellent "Self-Locker" . . . for use with the 5 standard points that do not lend themselves to knurling. It's an "Unbrako" Set Screw that positively will not shake loose . . . regardless of the most chattering vibration! (B) The Knurled Cup Point of this "Unbrako" Socket Set Screw makes it a "Self-Locker" also—because the counter-clock-wise knurls hold fast. "It won't shake loose"! Sizes available from No. 4 to 1½" diameter, in a full range of lengths.

Our patented "Unbrako" Self-Locking Knurled Socket Set Screws and Stripper Bolts lock in most any industrial screw application. They won't shake loose. Millions and millions in use.

Write us for the name and address of your nearest "Unbrako" Industrial Distributor and your copy of the "Unbrako" Catalog.

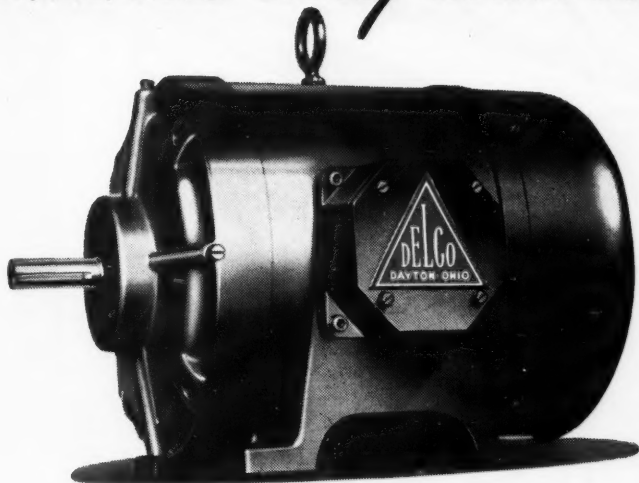
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STANDARD PRESSED STEEL CO.

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DELCO MOTORS

Eliminate costly down-time



Do away with profit-eating down-time! For dependable power, depend on Delco to provide industrial motors that stand up to their job . . . motors able to withstand the attacks of dirt and dampness, yet requiring the very minimum of maintenance.

Delco totally enclosed fan-cooled motors are produced in sizes ranging from fractional ratings to 75 h.p. (Continuous duty, constant speed, 60 cycle, polyphase.)

The Delco totally enclosed fan-cooled motor assures continuous, trouble-free power. Special features of Delco design—locked bearings, Delcote coil insulation, corrosive-resistant cast iron frame, positive lubrication, dynamically balanced rotor and shaft assembly, water-tight four-position conduit box—contribute to reliability and to economy of operation.

So, eliminate costly down-time . . . investigate the Delco industrial motor line. There's a Delco that's **RIGHT** for your job.

For complete data on Delco Motors, address Delco Products, Dayton, Ohio, or our nearest sales office.

DELCO MOTORS

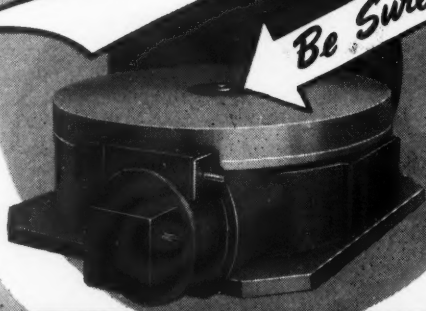
DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

SALES OFFICES: CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HARTFORD, CONN.



Buhr

Be Sure... Specify Buhr!



PRODUCTION INDEX TABLES

The Buhr Power Index Tables are fast, shockless and accurate for indexing with lowered operator fatigue. The tables are adaptable to horizontal and vertical applications.

The same high standards which have made Buhr Multiple Drilling and Tapping Equipment known throughout the metal working field, have been incorporated in the Buhr Index Tables. They were originally designed as components of Buhr Multiple Drilling Machines but are now offered as standard units to all industry.

**ALSO AVAILABLE IN HAND AND GEAR
OPERATED MODELS**

BUHR MACHINE TOOL COMPANY

ANN ARBOR, MICHIGAN

845 Green St.

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ROCKFORD *Hy-Draulic* DESIGN-POINT

for more accurate—
faster, planer work...

There are many reasons other than hydraulic drives and feeds that make Rockford Hy-Draulic Planers easier to operate, more accurate, and faster. One good example of better design is found in the cross rail construction of the Double-Housing Planer, as illustrated schematically above. At each end of the cross rail, as an integral part of the cross rail casting, is a long guide-way member. The total bearing surface provided between cross rail and column is as much as 300% greater than found in conven-

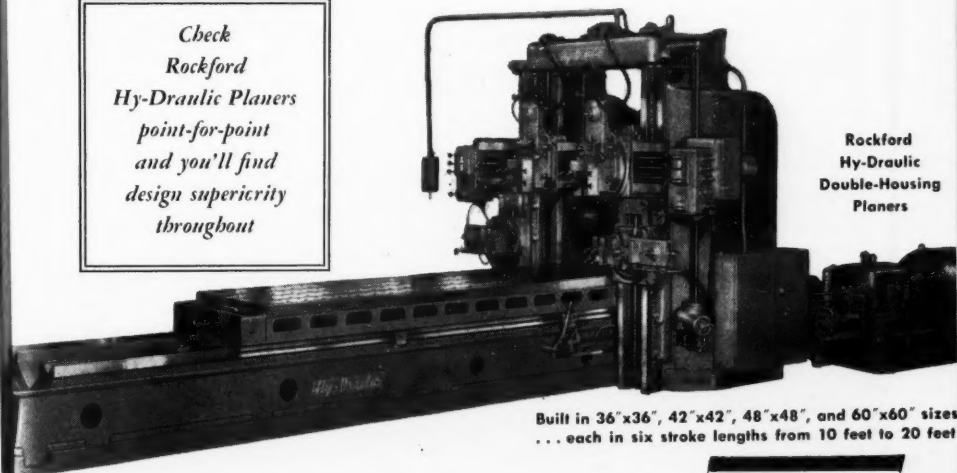
tional planer design. The result is a precision alignment between cross rail and table... that is dependably maintained under all conditions. Rockford Hy-Draulic Openside Planer cross rail members are of similar design.

For complete information on Rockford Hy-Draulic Double-Housing and Openside Planers... for complete data on Rockford Hy-Draulic point-for-point design advantages... write for Catalog 1947.

ROCKFORD MACHINE TOOL CO.
ROCKFORD, ILLINOIS

*Check
Rockford
Hy-Draulic Planers
point-for-point
and you'll find
design superiority
throughout*

Rockford
Hy-Draulic
Double-Housing
Planers



Built in 36"x36", 42"x42", 48"x48", and 60"x60" sizes
... each in six stroke lengths from 10 feet to 20 feet

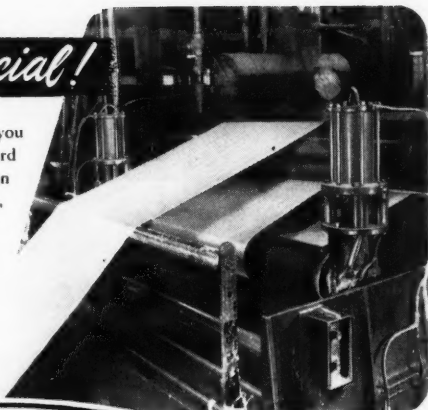
ROCKFORD Hy-Draulic Ram Type SHAPERS • 36" OPENSIDE SHAPER •
PLANERS • SLOTTERS • LEANER PLANERS

Hy-Draulic

NO JOB TOO

Special!

NO matter how special your requirements may be, you can meet virtually any need right out of the standard line of Hannifin cylinders. This is because the Hannifin line is COMPLETE! Any length stroke you want, double or single acting. Cushions for head end, rod end, or both. Ten standard bore diameters to choose from, ranging from 1" to 12". Larger or special types on order. All built to Hannifin's standards for quality: cylinders TRU-BORED and honed... rods ground and polished... all parts precision-made for complete interchangeability. Ask for engineering recommendations. Catalog on request.



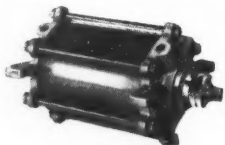
Hannifin flange mounted cylinders applying pressure on roll. Hammerless Mfg. Co., Garfield, N. J.

HANNIFIN

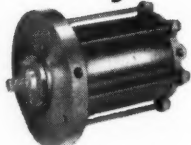
PNEUMATIC

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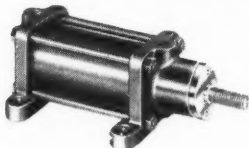
CYLINDERS



SERIES R



SERIES LW



SMALL BORE

Series "R" Leakproof Cylinders feature the exclusive external packing adjustment design developed by Hannifin for positive assurance against air leakage and increased convenience in maintenance. Sizes 3" to 12" bore. Any length stroke. 6 basic mounting styles, plus a wide variety of combination styles and double end piston rod models.

Hannifin Series "LW" Pneumatic Cylinders, featuring cup type piston packing, are preferred by many experienced engineers. Six standard sizes from 3" to 12". Any length stroke specified. Built in standard clevis, foot, base, trunnion, flange, and center line mounting styles. Also offered in a variety of combination and double end piston rod models.

Developed to meet the need for high quality 1", 1½", 2", and 2½" bore cylinders. Built with "LW" cup type piston construction: Six standard mounting styles. Any stroke desired. Also offered in combination and double end piston rod styles. In all Hannifin cylinders, standardized construction makes for lower engineering costs and quicker delivery.

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PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

**PICK THIS
BLADE**



**to Cut
Production Costs**

For longer service—often eight to ten times the life of ordinary tungsten steel blades — the GRIFFIN SPECIAL ALLOY power machine blade is your best buy. Molybdenum high speed steel, with strong, raker-set teeth. Made also in hand frame sizes.

OTHER GRIFFIN BEST BUYS

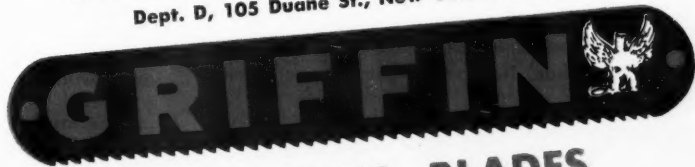
For clean, accurate cutting of tough alloy steels, pick the GRIFFIN HIGH SPEED STEEL blade; 18-4-1 tungsten high speed steel; in power machine and hand frame sizes . . . For general hand frame use, pick the improved NEW GRIFFIN; flexible as a soft-back, tough as an all hard . . . For sawing thin sheet or tubing by hand, pick the GRIFFIN NON-STRIP, with the teeth that don't break off . . . For precision contour sawing pick GRIFFIN BAND SAWS—choice of hard-edge-flexible-back, spring-temper, skip-tooth and wood-cutting types.

Ask your distributor for Griffin Blades. For latest 20-page Griffin Price List, write us.

General Sales Agent

JOHN H. GRAHAM & CO., Inc.

Dept. D, 105 Duane St., New York 8, N. Y.



**HACK SAW BLADES
AND BAND SAWS**

MADE BY G. W. GRIFFIN CO., FRANKLIN, N. H.
Hack and Coping Saw Blade Specialists Since 1880

FOLLOW THE LEADER

In Reducing Costs
Saving Time
Improving
Product-Quality



Re-Check Now On Your Metal-Working Methods and Materials!

Keep mounting costs in line with Brightboy, the leading adaptable abrasive. Brightboy suggests simpler methods, achieves faster production, because of the combined cleaning-burring-finishing-polishing action of rubber and abrasive. Brightboy shapes to contours; works to precision tolerances; achieves both conventional and special finishes. No special prepara-

tion required; does not load, gum or fill. Made in wheels, sticks, blocks and rods, for manual and machine operations.

WRITE FOR DATA: Address Brightboy Service Department on special production problems. Ask your distributor for the Brightboy Catalog-Manual and prices.



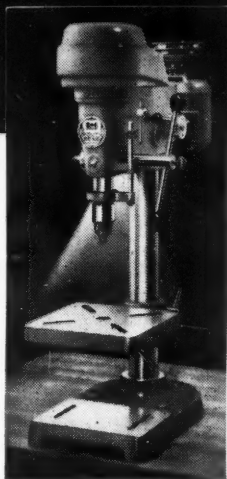
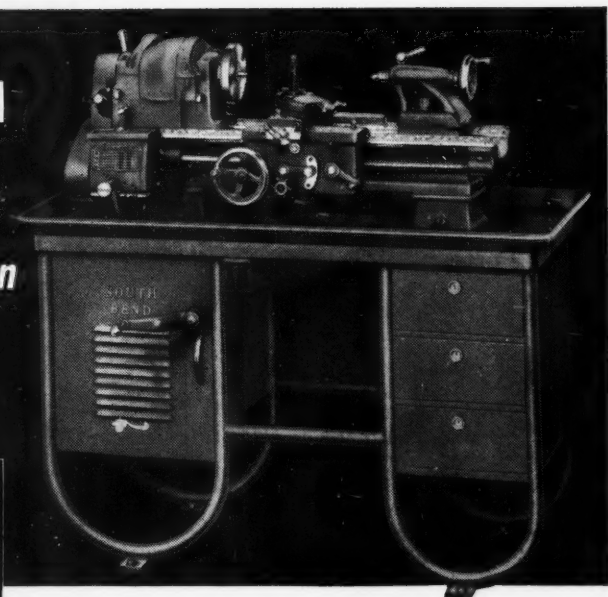
BURRING · FINISHING · POLISHING
IN ONE
OPERATION

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.
Newark 7, N. J.

The *SOFT RUBBER* binder **1** *CUSHIONS* the abrasive

SOUTH BEND

10" Precision Lathes



NEW SOUTH BEND 14 INCH DRILL PRESS

A ruggedly constructed drill press for precision work. Has built-in shielded illumination. Drill capacity $\frac{1}{2}$ " in steel. Priced at \$98, f. o. b. factory, bench model; less motor.



SOUTH BEND LATHE WORKS

Building Better Tools Since 1906

427 EAST MADISON STREET, SOUTH BEND 22, INDIANA

Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe illustrated. Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum switch; and bench

\$994³⁵

Capable of performing the most exacting operations on production and toolroom work, South Bend 10" Precision Lathes are made in quick change gear and toolroom models, mounted on either metal benches or floor legs.

They have $10\frac{1}{8}$ " swing over bed and saddle wings; $14\frac{3}{4}$ " to $32\frac{3}{4}$ " between centers; and 12 spindle speeds from 50 to 1357 r.p.m. South Bend Lathes with 9", 13", $14\frac{1}{2}$ ", 16", and $16\frac{1}{4}$ " swings; Turret Lathes with $\frac{1}{2}$ " and 1" collet capacities; chucks, tools, attachments, surface plates, etc., are also available for immediate delivery. Time Payments can be arranged. Write today for catalog.



GREATER PRODUCTION

insures

**LOWER
COSTS**

With the

**KALAMAZOO
METAL CUTTING
BAND SAW**

When you have a big job of cutting whether it is bars, angles, channels, tubes or odd shapes it is almost certain that the Kalamazoo Band Saw can do it for you **FASTER** and more accurately.

The amazing production is due to continuous cutting action, quick set-up and high speed.

The coolant model (illustrated) is ideal for continuous production. Without the coolant it is a big time and labor saver on short runs. Portable—plugs in anywhere. Automatic in operation. A lot of production for a small investment.

MACHINE TOOL DIVISION

KALAMAZOO TANK & SILO COMPANY

KALAMAZOO 16 • MICHIGAN

HE READS MINDS—

*yours,
too!*



YOUR UNION DRAWN DISTRIBUTOR



You often may think your Union Drawn Distributor has mind-reading powers.

In truth, his ability to anticipate your steel bar and shafting requirements depends on more practical methods.

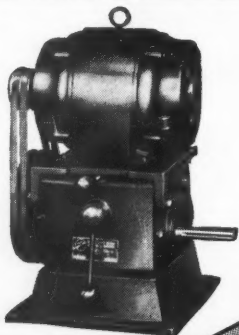
For example, he keeps up to date on the sizes and shapes of cold finished bars and shafting in demand in his territory. Then, he maintains stocks in proportion

to needs in his conveniently-located warehouse . . . ready for your call.

The value of this service has been proved time after time . . . by preventing stoppage of production lines—by helping to get rush jobs started. Let your Union Drawn Distributor help you. His stockroom service, his fast delivery can save you many hours and many dollars. Give him a call *soon*.



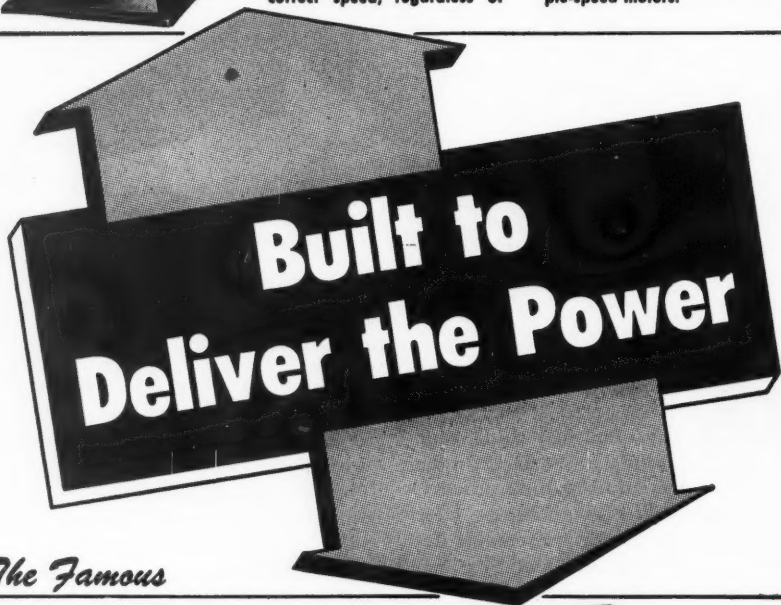
Republic UNION
COLD DRAWN STEELS



The New **TURNER** *Multi-Speed* **POWER UNIT**

Power transmission FLEXIBILITY... now available for industrial applications. Where pre-determined speeds are needed, or in problems of speed production with multiple speeds, Turner has the answer. Just a flick of the wrist selects the correct speed, regardless of

changeable conditions. Ideal for mixing, agitating, printing presses, textile, wood and paper processing, feed rolls and conveyors, wire and textile spinning... scores of other applications. In many cases, replaces hard-to-get slip-ring and multiple-speed motors.

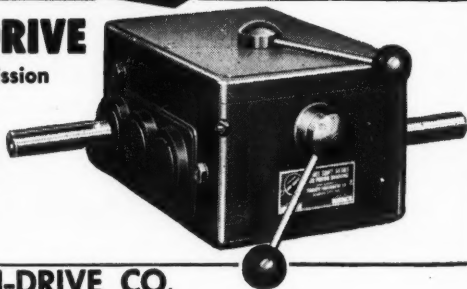


The Famous

TURNER UNI-DRIVE

Selective Sliding Gear Transmission

Make older machines more versatile. Operate each independently. Eliminate overhead line and counter shafts with Turner Uni-Drive! Save time, cut costs... 3, 4, 6, 9 speeds to meet every need. Standard brackets for quick installation on lathes, shapers, screw, milling and hobbing machines, boring mills... many others.



THE TURNER UNI-DRIVE CO.

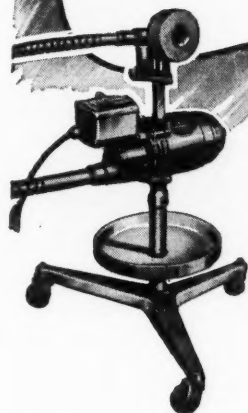
(Sales Division, Turner Machinery Co.)

3416 Terrace Street Dept. 105 Kansas City 8, Mo.

OPERATORS HANDLE...

se?

**Less Weight
More Power**



with a

Mall
REG. U.S. PAT. OFF.



FLEXIBLE SHAFT GRINDER

As the motor is mounted on an easy-rolling floor stand or overhead trolley, the working tools on a Mall Flexible Shaft Grinder are lighter in weight, more compact, more comfortable to hold, easier and less tiresome to handle. This means fewer rest periods—more time on the job. Spots can be reached that are inaccessible to heavier, more cumbersome self-contained motorized tools. More than this, every Mall motor is dynamically balanced at the factory to assure true concentric motion in the tool. Attachments for Grinding, Disc Sanding, Wire Brushing, Buffing, Polishing and Drilling are interchangeable. Available in 3 H.P. Geared Head—4500 r.p.m.; $\frac{3}{4}$, 1, $1\frac{1}{2}$ H.P. Direct Drive—3450 r.p.m.; and $\frac{3}{4}$ H.P. Counter-shaft models—1650 to 7400 r.p.m. All with tilting, swiveling, dustproof electric motors.

Ask your Supplier or write Power Tool Division for literature.

MALL TOOL COMPANY

7814 South Chicago Avenue

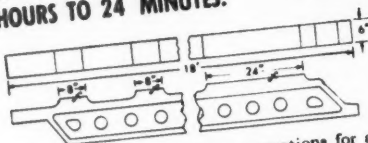
Chicago 19, Illinois

Preferred by Master Craftsmen

KENNAMILLING CUTS MACHINING TIME FROM HOURS TO MINUTES

ON STEEL

"UNIVERSAL" FACE KENNAMILL
CUTS MACHINING TIME ON
CAST STEEL BEAMS FROM
3 HOURS TO 24 MINUTES.



It took 3 hours and 2 separate operations for a HSS cutter and a carbide-tipped cutter to rough and finish mill four of these cast steel beams, having heavy sand inclusions. A "Universal" Face Kennamill removes the metal in one pass—gives superior finish—and reduces machining time 87%.

The "Universal" Face Kennamill is today's outstanding carbide cutter for milling steel. Its features include solid, advanceable Kennametal blades of tremendous strength and wear-resistance; a steel cutter body with precision-ground slots that support the Kennametal blades perfectly; and mechanical clamping that securely holds the blades with complete absence of strain.



KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

There are standard Kennamills available for most face milling operations. See particulars in Catalog 48. Write for your copy.



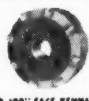
HALF-SIDE KENNAMILL
(Solid blades)



"CF" KENNAMILL
(Solid blades)



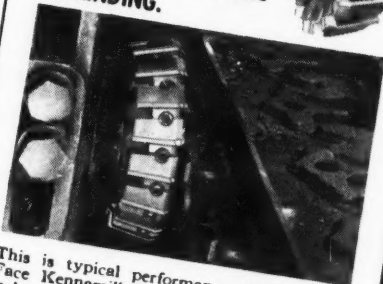
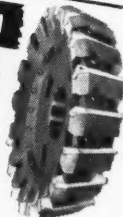
STEP KENNAMILLS
(Kennametal-tipped blades)



"DDB-JOB" FACE KENNAMILL
(Kennametal-tipped blades)

ON CAST-IRON

AXIAL FACE KENNAMILL
ROUGH AND FINISH
MILLS IN ONE PASS.
TURNS OUT 627 CYL-
INDER HEADS BEFORE
REGRINDING.



This is typical performance by the Axial Face Kennamill—a total of 18,755 square inches milled on cast iron cylinder heads before the blades required sharpening. Even then, the blades were in very good condition, and were reground only in order to maintain the high finish required on the manifold face of the piece.

The Axial Face Kennamill has solid blades of extremely abrasion-resistant Kennametal that give extended service without need for sharpening. It is designed for high rate milling with light or medium cuts on cast-iron. Grinding simplicity is one of its many cost-cutting features—it can be sharpened in a tool and cutter grinder, and usually only two surfaces on the blades need to be redressed.

Do you make brass parts like these ?



Electro-Cycle TRADE MARK makes them *52% faster*

● When an efficient plant in the highly competitive brass industry can increase production of the parts shown above by 52%, *that's news!*

Six new Warner & Swasey Electro-Cycle Turret Lathes, replacing six cone head machines, did just that. These new Electro-

Cycles, with their instantaneous automatic spindle action, are making records just as remarkable in many other brass shops across the country.

Hadn't you better find out what they can do for you?



You Can Machine it Better, Faster, for Less... with a Warner & Swasey

TURRET LATHES; MULTIPLE & SINGLE SPINDLE AUTOMATICS; PRECISION TAPPING AND THREADING MACHINES

BUILT RIGHT! PRICED RIGHT!

GREAVES
No. 2-H
MILLING
MACHINE
PLAIN OR
UNIVERSAL



Simple in design. Easy to operate. Rigid construction including every worthwhile modern feature of milling machine development. With 18 spindle speeds (20 to 1000 R.P.M.) both the universal and plain millers are readily adaptable for heavy duty or light precision production work. Send for bulletin.

DEALER
TERRITORIES
AVAILABLE

Write for
complete details



Greaves **MACHINE TOOL CO.**

N-2015 EASTERN AVENUE, CINCINNATI 2, OHIO



if it takes you more than

28 minutes to pierce this one panel...

then you'd better get a **WIEDEMANN**



The same short run piercing job took 28 minutes on a Wiedemann R-4P because layout time was completely eliminated. There was no waiting for the die set-up man . . . all punches and dies were carried in the turret of the machine right at the operator's fingertips.

There's a Wiedemann Turret Punch Press that can save you both time and money on every short run piercing operation . . . chassis, instrument panels, electrical boxes, bus bars, sheet metal parts, and plate up to $\frac{3}{8}$ " in thickness.

Get the facts today. Send for the story of short run piercing economy . . . Bulletin 92.

WIEDEMANN MACHINE CO.

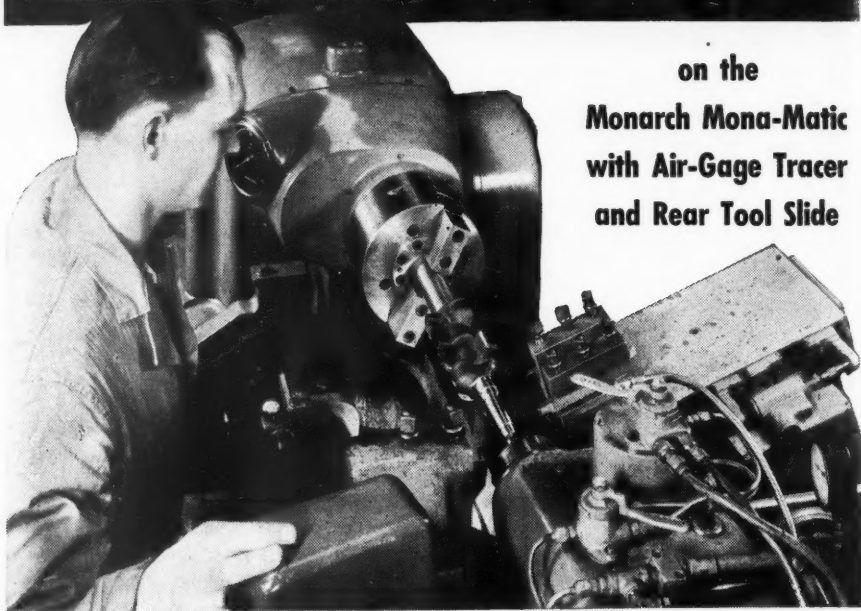
4219 Wissahickon Ave., Phila. 32, Pa.

HERE'S THE ACTUAL JOB!

Check these production times . . .
typical work of the R-4P.

- * 47 strokes required to complete job
- * 8 different dies required - R-4P Pin Type Gauge
- * Total time to produce first piece . . . 28 minutes
- * Time for every subsequent piece . . . 9½ mins.

INVESTMENT RETURN 125% PER YEAR!



on the
Monarch Mona-Matic
with Air-Gage Tracer
and Rear Tool Slide

Action-compelling news for all production men! A customer tells us he's replacing *six* modern lathes (four of them only slightly more than a year old) with *two* Monarch Mona-Matics.

On the basis of actual performance, this installation shows savings more than sufficient to pay for the machines, together with all tooling and templates, the first year.

Such savings are possible because:

1. The completely automatic cycle permits one operator to service a battery of two machines *easily*, thereby doubling output per machine.
2. The Air-Gage Tracer provides single-point, *uninterrupted-cut* metal turning at a rate of output not possible on other types of machines.
3. No time is lost in needless second operations.

4. Setup time never exceeds ten to fifteen minutes.
5. Tool investment and tool sharpening time hit a new low.
6. An important plus—the Air-Gage Tracer-guided cutting tool often reduces the amount of grinding stock by more than half.

Ask us to show you how investing in the Monarch Mona-Matic will save you money in a BIG way.

JOB FACTS...

SAE 4140 steel forged crankshaft 16½" long; each end completely finish-turned for grinding in one operation, using carbide cutting tools. Tolerance—.002". On a battery of two machines, actual machining time per shaft averages .62 minutes.



THE MONARCH MACHINE TOOL COMPANY • Sidney, Ohio

FOR A GOOD TURN FASTER — TURN TO MONARCH

SUTTON

SIGNIFIES
SUPERIOR SERVICE
IN
COLLETS and FEEDERS



- Supplies quickly and accurately quality collets and feeders that meet your requirements.
- Makes standard and special collets and feeders for all automatics, lathes and milling machines.
- Features diamond serrated collets that grip tighter with less tension — are self-cleaning — reduce spoilage.

"Only Sutton Collets are Diamond Serrated"

SUTTON TOOL COMPANY
STURGIS, MICHIGAN

SUTTON  **COLLETS**

Apex Insert Bits do **MORE**

for **LESS**



Whether you use Phillips, Slotted, Clutch Head, Frearson, Hex Head or Socket screws—it's all the same to Apex.

Apex Bit Holders do a big job with a minimum inventory. You merely get the Bit Holders you need for *your* drivers—then simply order new tips as needed and discard the old ones.

Holders accommodate the short, money-saving bits in a full range of sizes. Holders are furnished for practically all makes of power and spiral drivers.

For hex head screws each replaceable, long-wearing socket has *two lives*. Use one end till it is worn, then turn end for end—and you have a new socket.

Catalog No. 20 gives all the facts. Write for it.

APEX

insert
type
bits

THE APEX MACHINE & TOOL COMPANY, 1028 S. Patterson Blvd., Dayton 2, Ohio

Safety Friction Tapping Chucks; Quick Change and Positive Drive Drill Chucks; Vertical Float Tapping Chucks; Parallel Floating Tool Holders; Power Bits for Phillips, Slotted Head, Frearson and Clutch Head Screws; Hand Drivers for Phillips, Frearson, Clutch Head Screws; Aircraft, Industrial Universal Joints; Sockets, Universal Joint Socket Wrenches

ACCURATE

STURDY

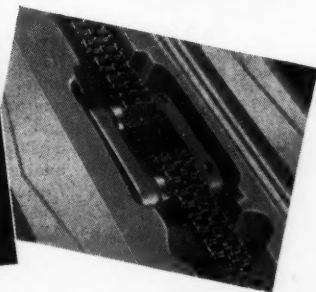
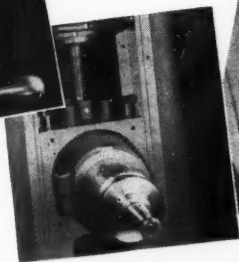
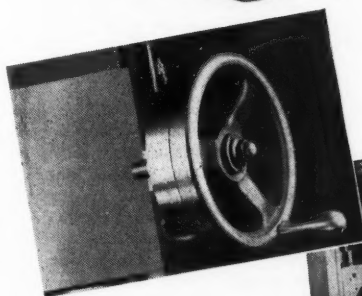
CONVENIENT

For the most accurate tool room work this 6" x 18" Hammond Surface Grinding Machine.

Solid construction with smoothly operating movements make the Footburt-Hammond Surface Grinding Machine one that will consistently turn out superior grinding work for the tool room or for exacting production work.

Write for full information on this 6" x 18" hand feed machine.

THE FOOTE-BURT COMPANY • Cleveland 8, Ohio
Detroit Office: General Motors Building

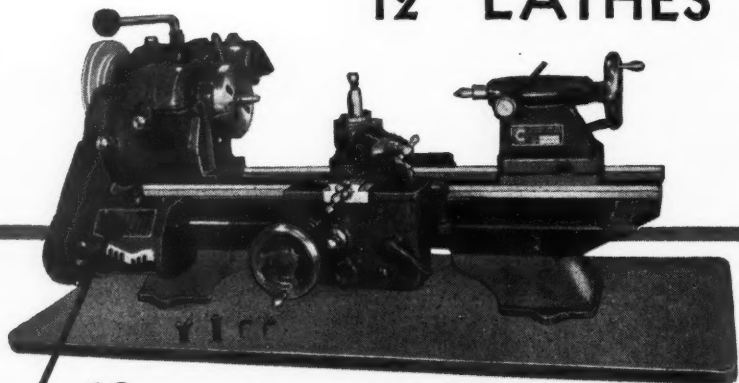


FOOTBURT

Sensitive
DRILLING MACHINES

Clausing

DUAL QUICK CHANGE 12" LATHES



48 THREADS AND POWER FEEDS AT YOUR FINGERTIPS

ADDITIONAL

Clausing

FEATURES

- Precision ground bed with two flat and two vee ways
- Adjustable Timken tapered roller bearing headstock
- Ball bearing friction clutch countershaft
- Nine spindle speeds from 33 to 2400 r.p.m.
- Hooded V-belt drive
- Automatic apron

Designed for wide range performance and utmost ease of operation. The Clausing Dual Quick Change 12" Lathe gives instant selection of 48 threads and feeds . . . simply by shifting two levers. Gives finer feeds instantly without stopping lathe. Saves set-up time and operating time on any turning operation requiring power feed. Easy-to-read chart shows lever and gear positions. The Synchronized Gear Box is of "big machine" design and construction. Liberal use of precision ball bearings on which shafts turn readily, with a minimum of friction. Gears are machine cut, $\frac{1}{2}$ " wide for greater strength and longer life. Compare the Clausing Quick Change with lathes in this price range.



For smooth, accurate performance, greater convenience and lasting satisfaction investigate Clausing Lathes today.

CLAUSING MANUFACTURING CO.

229 RICHMOND AVE.

OTTUMWA, IOWA

Take high cost labor off obsolete machines

PRODUCE MORE WITH THE NEW

SIBLEY

MODEL C-20
20" DRILLING
MACHINE

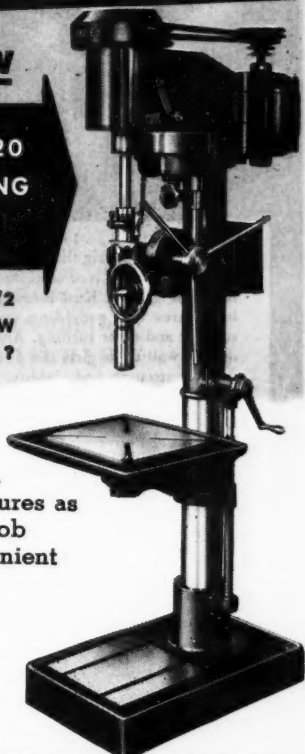
10 YEARS AGO LABOR COSTS WERE 1/2
OF TODAY'S—ARE YOUR MACHINISTS NOW
USING THE SAME DRILLING MACHINES?

Install a new model C-20 in your plant and make a comparison with production obtained from your present drilling equipment. It will demonstrate the advantages of such features as easy access to controls—where you turn a knob to select the proper geared power feed; convenient shifting of V-belt; power to drill 1½" in mild steel; 8 spindle speeds ranging from 65 to 1360 R.P.M. powered by a 2 H.P. motor.

Model C-20 Sibley 20" swing drilling machine complete as illustrated with 2 H.P., 3 Phase, 60 Cycle, A.C. motor and magnetic type starting switch

\$84975

F. O. B. South Bend, Indiana



SIBLEY

MACHINE & FOUNDRY CORP.

37 EAST TUTT STREET
SOUTH BEND 23, INDIANA

SIBLEY MACHINE & FOUNDRY CORP.
37 East Tutt St., South Bend 23, Indiana
Send Catalog No. 67.

Name _____ Title _____
Company _____
Address _____
City _____ State _____

FOR YOUR BIGGER JOBS

*... a truly powerful
machine*

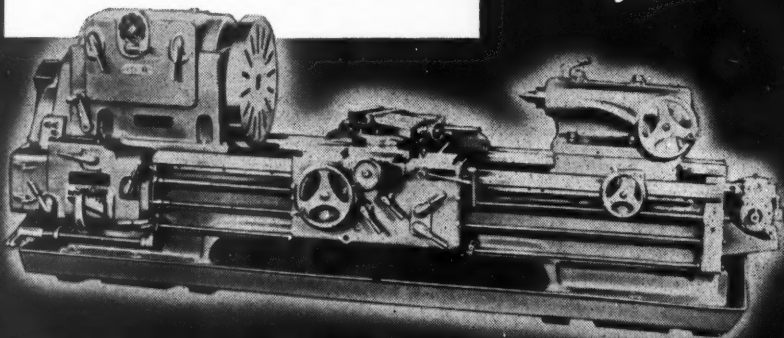
From the base up rigidity is emphasized. For example, the four wall bed is of semi-steel, nickel mixture having close grained hard bearing carriage ways—beds have three vees providing extra rigidity for both straight and taper turning. Also in addition to usual double wall cross girts there is a double wall center girt for strength and rigidity.

Then as on all 16 speed Sidney lathes the exclusive Sidney continuous tooth herringbone geared headstock which delivers more power smoothly on all cuts.

If your work calls for a swing up to 32 inches—put it on a Sidney for rigidity—closer tolerances and ultimate economy.

Bulletins on all sizes available.

*Sidney
32"
Lathes*



SIDNEY MACHINE TOOL *Company*
BUILDERS OF PRECISION MACHINERY SINCE 1909 SIDNEY, OHIO


A RAZOR

A LOCOMOTIVE

AND FAST TABLE TRAVEL

**125 f. p. m. longitudinal table speed
means fast micro-accuracy* production
with GRAND RAPIDS GRINDERS**

CONTROL
VALVE

 Fast longitudinal table travel — the fastest available in any grinder — is an important reason why you find Grand Rapids Grinders in so many leading plants. Such rapid operation makes possible high-speed, accurate production . . . of small mass-produced razor parts, as well as massive locomotive sub-assemblies.

You get many other assurances of long-life speed and accuracy in Grand Rapids Grinders, such as: vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; flanged-type, pre-loaded ball bearing spindle.

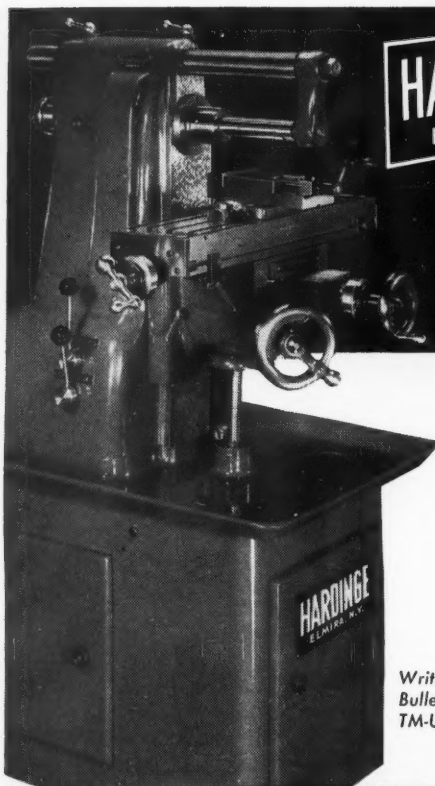
* Accuracy within 0.00025 limits

To serve you — Your inquiry concerning your specific grinding needs will receive prompt attention.
Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.

**GALLMEYER &
LIVINGSTON**
COMPANY

GRAND RAPIDS GRINDERS

308 Straight Avenue, S. W., Grand Rapids 4, Michigan



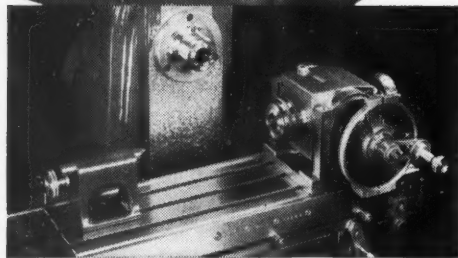
HARDINGE
ELMIRA, N.Y.

HIGH SPEED PRECISION MILLING MACHINE

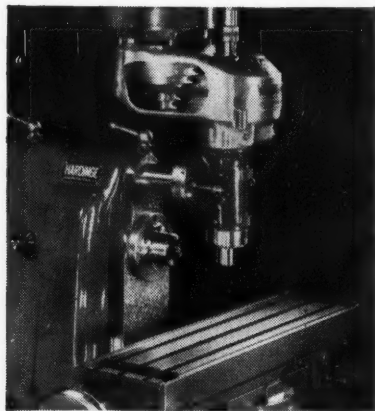
FOR
TOOL ROOM AND LABORATORY

Tool room and laboratory work, because of the variety, demands useful milling machine attachments. Hardinge knows this. Illustrated are two attachments in addition to the arbor and vise shown below. Other attachments are: Power feed for table; oil coolant facilities; 360° swivel base, also right angle base for dividing head; taper hole collets, as well as regular collets; step chucks and jaw chucks for dividing head.

Write for
Bulletin
TM-UM



Modern design universal plain dividing head and tailstock. Designed to match the precision qualities of the machine. Features are: Preloaded ball bearing spindle; takes standard 1" capacity collets same as used in horizontal spindle; and high speed indexing, 4 to 1 ratio.

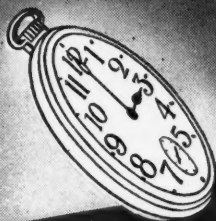


This attachment provides high speed vertical milling. Has separate motor driven preloaded ball bearing spindle — eight selective speeds from 465 to 4250 r.p.m.—takes standard 1/2" capacity collets. Vertical head swivels to angular settings.

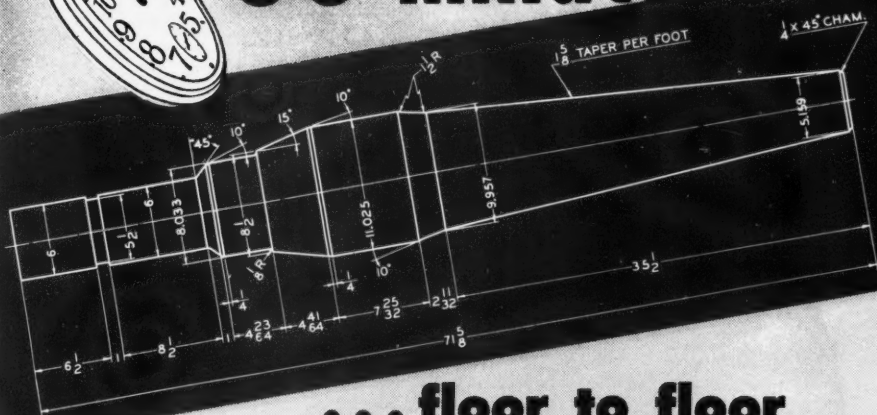
HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

Offices in principal cities. Export office: 269 Lafayette St., New York 12, N. Y.



86 minutes



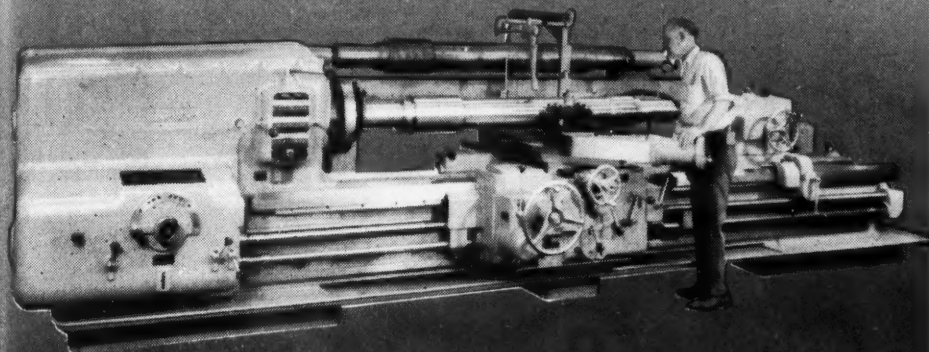
... floor to floor to machine this shaft

This represents an amazing saving over previous methods and proves conclusively that the new "AMERICAN" Hydraulic Duplicating technique is a positive answer to production and cost problems.

The new 25-inch "AMERICAN" Hydraulic Duplicator on which this job was done has the enormous power, the unfaltering stamina and the ease of control which combine to make it the production marvel

of the moment. Cost-minded executives from every quarter of this country and from many countries abroad have shown vital interest in this new machine. Many orders already have been placed and many machines now are in service breaking production records daily.

Complete descriptive data will be sent immediately upon request. For convenience just ask for Bulletin No. 35.



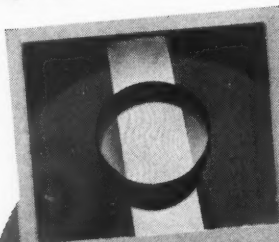
THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

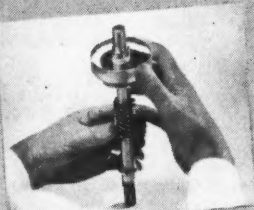


Van Keuren

LIGHT WAVE EQUIPMENTS are the proof of Precision



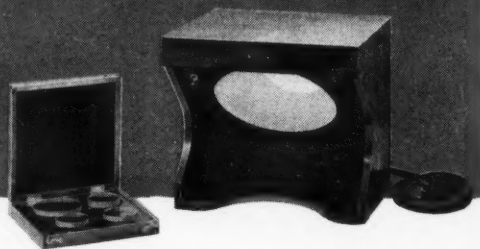
Detecting worn spot on amplifying gage anvil.



Checking flatness of tapered shoulder on a shaft with a special 3" diameter x 29/32" hole Fused Quartz Optical Flat.



Checking the flatness and parallelism of a micrometer anvil and spindle with a 1 1/2" diameter Van Keuren Fused Quartz Optical Parallel.



LIGHT WAVE EQUIPMENT \$300.00

Twenty-eight years ago, when the Van Keuren Light Wave Equipment was introduced to American Industry, measurements in Millionths of an inch seemed visionary and unnecessary. Today's and tomorrow's production requirements are specified in Micro-inches (millionths of an inch) and the ability to measure in these units is no longer visionary but a must.

The Van Keuren Light Wave Equipment includes a set of 4 self-checking double surface FUSED QUARTZ optical flats and an improved, instant starting 60 cycle 110 volt, minimum heat monochromatic light (light of one wave length or color).

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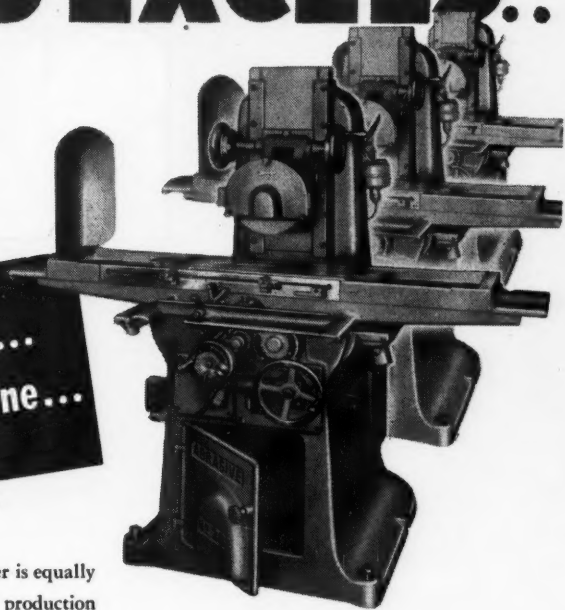
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The Abrasive 3B Surface Grinder is equally adapted for toolroom use and production line. With quick-change versatility it's the ideal flat grinder for jig, die, and gage making in the toolroom. On production runs, automatic longitudinal and transverse feeds speed the output of top-notch precision work... the 3B meets heavy production schedules on time, all the time. Has large capacity: the 3B takes work up to 24" long, 8" wide, and 12" high. Massive bed construction, smooth running spindle and vibration-free table travel mean extreme accuracy and fine finish on every job.

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Drive: 3 H.P. motor

**Wheel Size: 10" standard. 8" or
12" available on request**

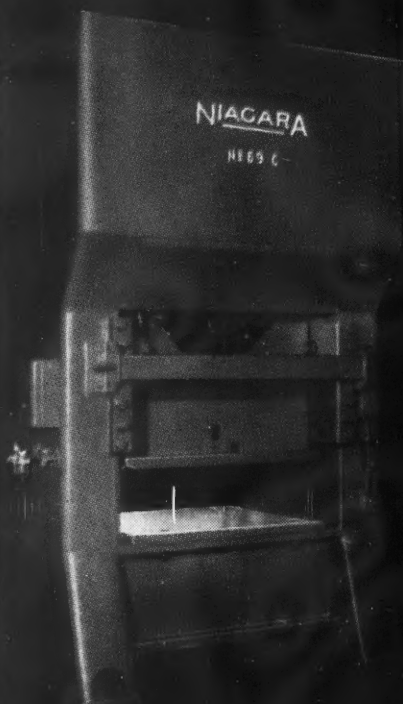
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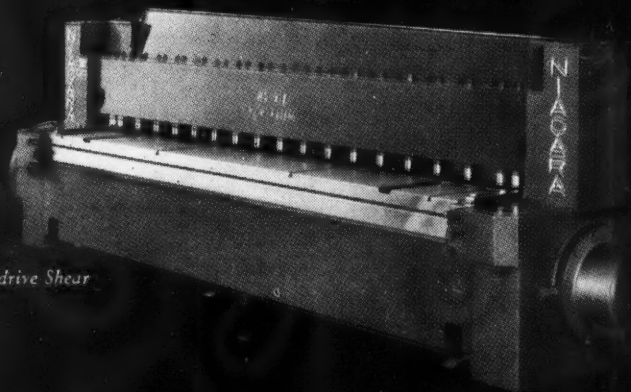
NIAGARA



Niagara Double Crank Press



Niagara Deep Throat Press



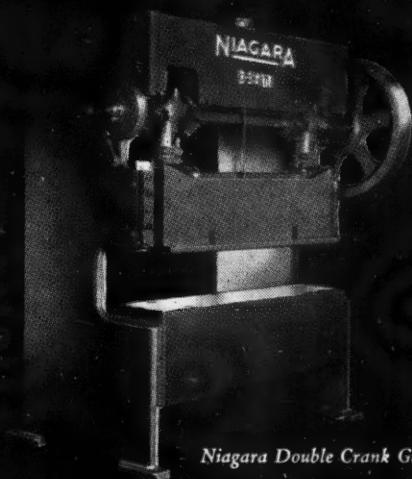
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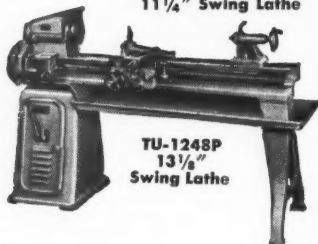
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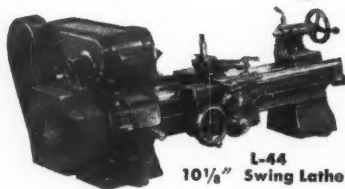
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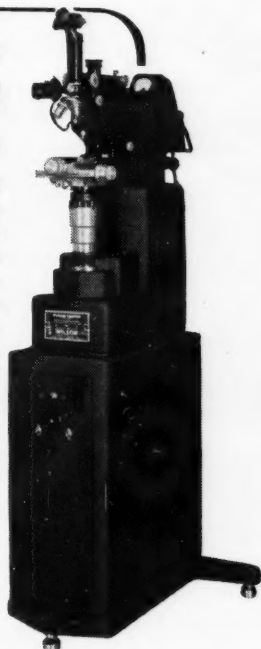
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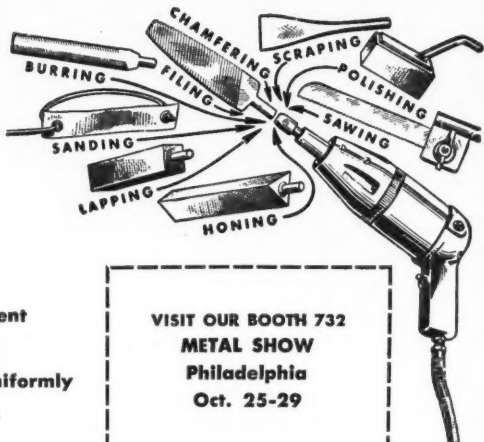
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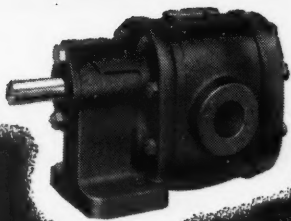
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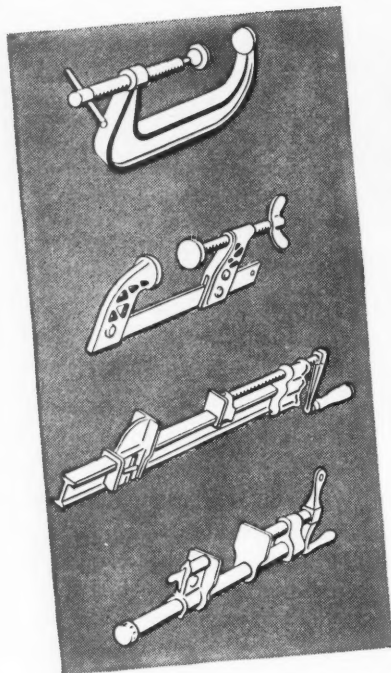
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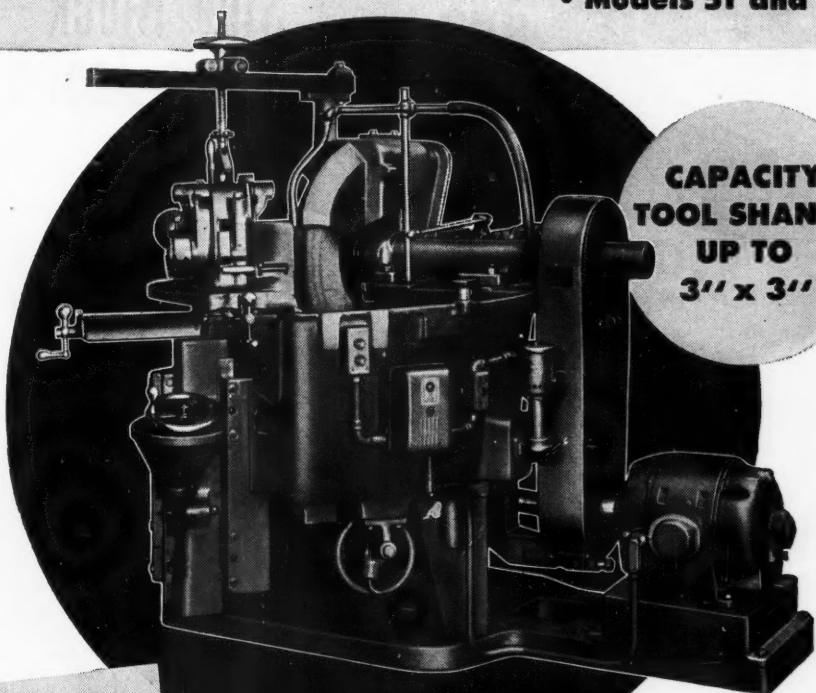
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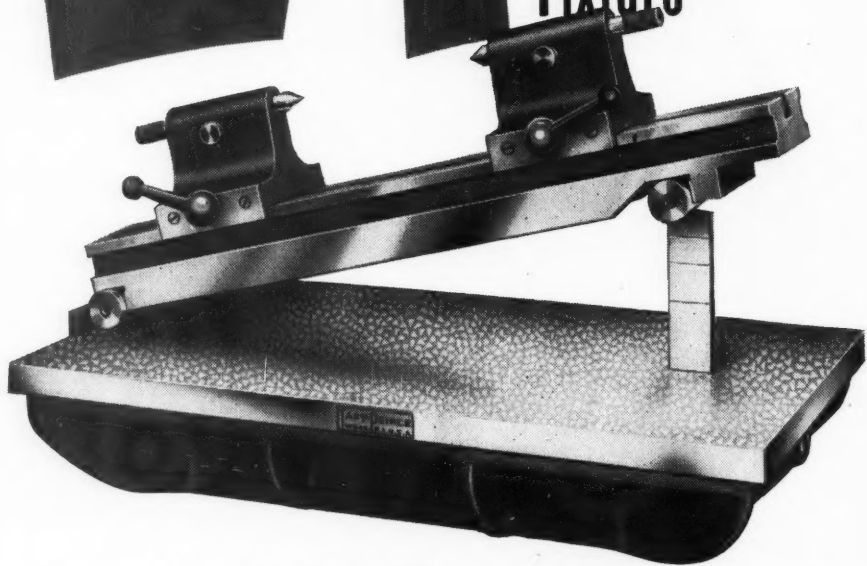
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M A C H I N E T O O L C O R P O R A T I O N

21" Taft-Peirce Sine Block Taper Testing Fixture



...for Precision Checking of Tapers and Angles

Taper Testing Fixture mounted
on Taft-Peirce Precision Surface
Plate Style 9211

Here's a versatile Taft-Peirce fixture which will do a double job in any toolroom. First it enables you to check tapers up to 15" long and 6" in diameter with an unusually high degree of accuracy. Also, when center heads are removed, it gives you an extra-long (20") sine bar for extremely precise angle checking.

Made to top-precision standards, this sine block fixture insures top-precision in inspection. The sine block is made of an alloy steel, hardened, treated to insure

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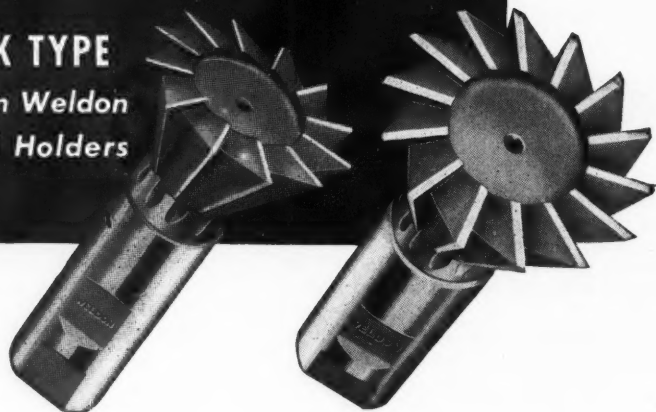
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SHANK TYPE

For use in Weldon
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The Type D Roto-Clone is a dynamic precipitator combining

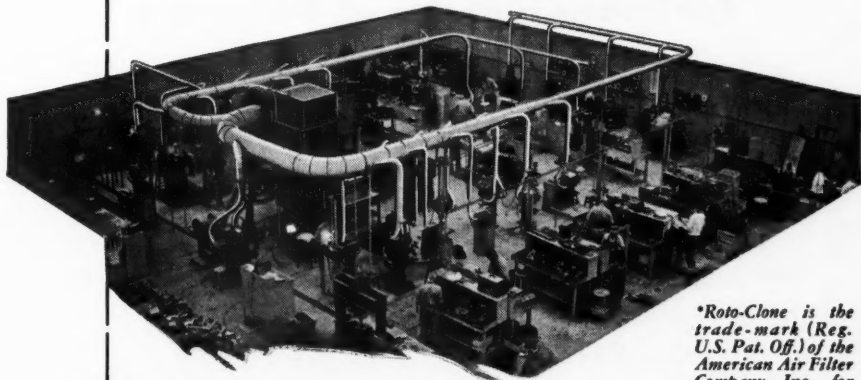
the functions of exhaustor and dust separator in one self-contained unit. Uniform air volume assures high collection efficiency. It is economical to operate; can be located at or near dust source and may be installed as a central system or to serve a single operation.

For complete information on the Type D and other Roto-Clone units, call your local AAF representative or write direct to—

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**Roto-Clone is the trade-mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.*

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Custom engineered for your job, Manhattan Abrasive Wheels cut cost and speed production on all grinding operations.

Exclusive Manhattan developments in both Rubber and Resinoid Bonding assure you production economies of fast metal removal with long wheel life.

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MANHATTAN RUBBER DIVISION

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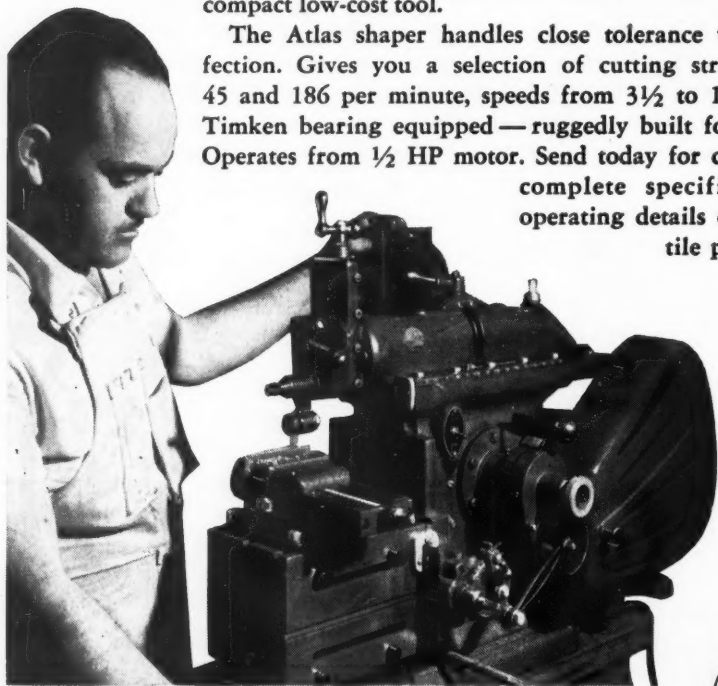
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"Match the machine to the job" is an idea that is tremendously helpful in tool room and shop . . . and especially valuable in shaping operations. Most of them are within the 7" stroke of the Atlas shaper. You can save considerable on set-up time, machine hour and power costs with this compact low-cost tool.

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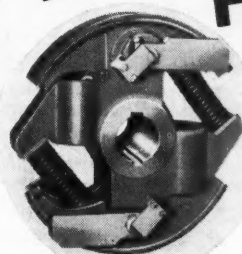


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THE CLUTCH IS THE HEART OF THE PRESS



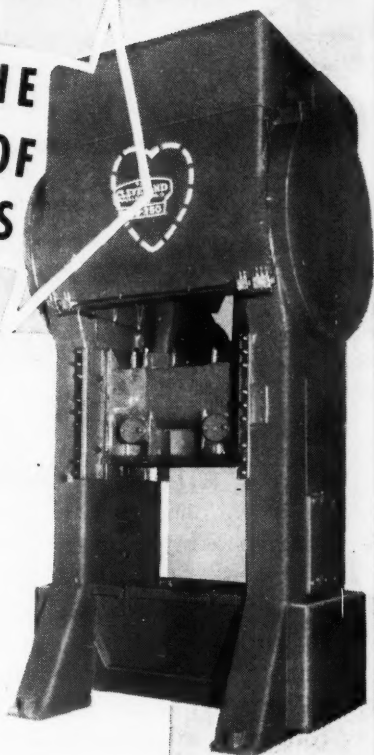
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AMPERES	14.8 at 230 v.				19.6 at 230 v.				20.2 at 230 v. C	
WATTS	3400				4500				4650	
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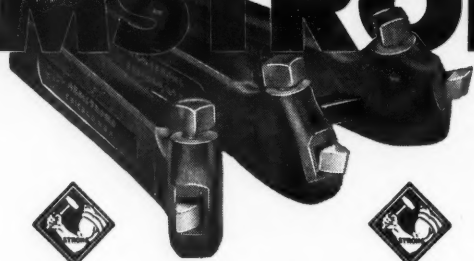
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See that each lathe, planer and shaper operator has the correct ARMSTRONG TOOL HOLDERS for each operation he performs. Equip each machine with its full complement of ARMSTRONG Setting-up Tools. Use better balanced, handier ARMSTRONG WRENCHES on machines and assembly lines. Specify ARMSTRONG Drop Forged "C" Clamps and Lathe Dogs . . . Today, only quality tools can be truly economical.

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MODERN Machine Shop

SEPTEMBER, 1948

VOL. 21, No. 4

CINCINNATI, OHIO

This Month

Some of the most interesting applications of air actuated devices we have been privileged to see in operation are presented in this month's feature article. Even though your production setup may not be exactly the same as the one presented, we feel sure that this write-up which covers the San Diego Machine Company will give you a great amount of worth-while information that may be converted into practical use in your own plant.

The right proportion of theory has been combined with practical experience in the article "Shot Peening for Longer Life" which you will find on page 112. Mr. Wieschhaus explains the shot peening method and the equipment to be employed for obtaining the best results—results which point to greater fatigue life for a wide variety of workpieces.

Mr. Albert W. Gray in his article "Monotony in Machine Shop Work," page 138, points out some interesting facts which have come to light as a result of research work on machine shop workers engaged in repetitive operations.

In Mr. Hinman's eighth article on "Progressive Die Design" a description of the design and operation of a progressive die for blanking clock parts is presented. Page 154.

On several occasions in the past we have presented articles which were intended to give the reader a broader view of the machine tool field. Response to articles of this nature has been encouraging. As a matter of fact, we believe you will find "Selling Tools" by B. N. Brockman as enlightening as any of those which we have previously published. Page 166.

You will find the usual assortment of ideas contributed by the readers on page 200. "News of the Industry" section will be found on page 218. Don't overlook the "New Shop Equipment" section beginning on page 236.

Next Month

"Freedom Issue" of MODERN MACHINE SHOP.

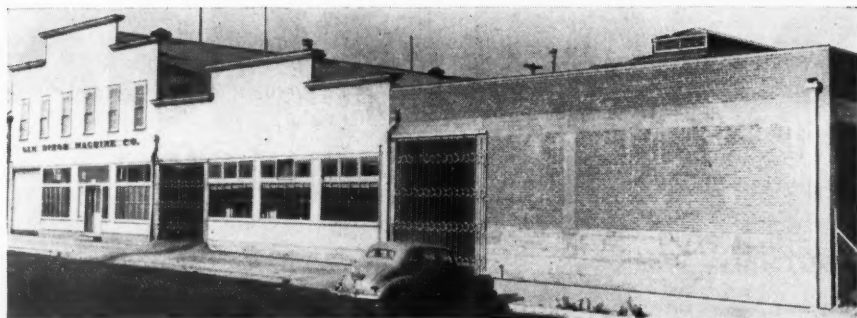


Fig. 1—Shop of the San Diego Machine Company, San Diego, California.

Ingenious Uses for Compressed Air Found by West Coast Aircraft Parts Manufacturer

(Data and photographs for this article were supplied through the courtesy of the Compressed Air and Gas Institute)

By HOWARD CAMPBELL
Editor, MODERN MACHINE SHOP

UNDER the forced draft of war production, thousands of small shops throughout the United States have developed ingenious methods for solving their problems — problems which have been created by shortages of one kind or another. Some of these war-born ideas are paying off today in peacetime production gains. Take, for example, the San Diego Machine Company of San Diego, California.

This West Coast shop made parts

for eight of the more important makes of airplanes during the recent war. Its subcontracts, today, include parts for motor scooters, replacement orders for aircraft parts, and so on. Man hours are being saved on virtually all machining operations by means of the same applications of compressed air which were developed to meet war production requirements. A view of the San Diego Machine Company's plant is shown in Fig. 1.

In the interior view of the plant, Fig. 2, can be seen the overhead duct which, extending through the shop, carries the air lines, and the lines which carry current for light and power. This duct is so set up that contacts can be made at points 12 inches apart anywhere along the line. The air line, which can be seen extending just above the duct, is slanted toward the rear of the shop so that condensate will gravitate to the rear end, from which it can easily be drawn off.

Fig. 3 shows the operation of boring and facing the ball rings, for which a "Fastermatic" lathe is used with a three-jaw air chuck. The use of the air chuck permits the work to be loaded into the machine and unloaded without stopping the machine, thus cutting the production time to one-third of that which would be required with manual loading. Using a carbide tool, the boring and facing operation is performed in 25 seconds complete, and the cut is held to a limit of $-0.000 + 0.001$ inch. In the third operation the ball ring is rough turned, and in the

fourth operation it is trimmed to width.

The illustration Fig. 4 shows one of the home-built spherical turning machines with which the rough turning operation on the ball ring is performed. This machine was developed when war production necessitated maximum speed regardless of the equipment available. The machine was built from a "rear end" taken from an old Nash automobile. Each machine is equipped with two air cylinders and one hydraulic cylinder. When the air valve is opened, air flows into the hydraulic cylinder, forcing the piston up or down, as the operator wishes, at a steady feed, the rate of feed being controlled by setting of a small valve in the oil line to the oil cylinder.

To load the machine the ring is placed over an expanding collet, which is also operated by compressed air. The air-expanding collet not only permits faster loading and unloading of parts as the operator makes his round from one machine to the next, but also provides a positive pressure that pre-

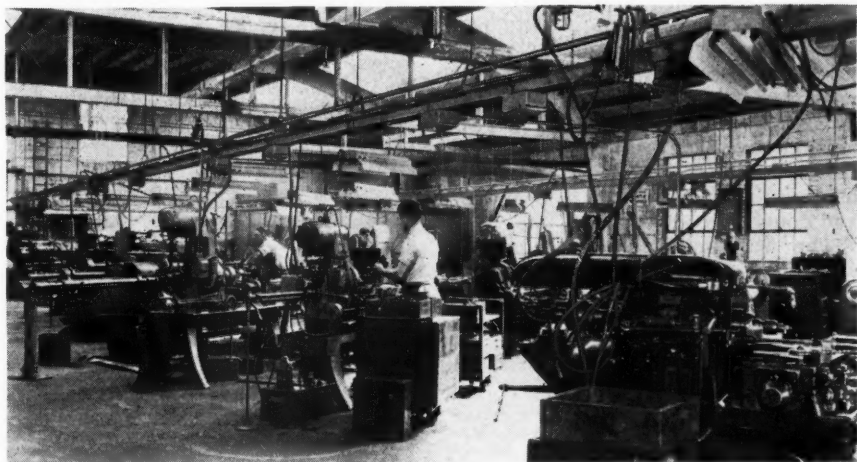


Fig. 2—Interior of San Diego Machine Company shop, showing arrangement of equipment. Note particularly the duct extending over the machines, carrying air, light and power lines. Contacts can be made at any 12-inch point along the line.

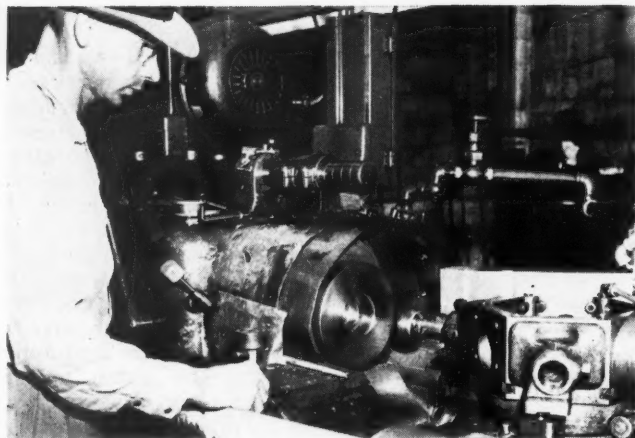


Fig. 3—Equipping of heavy lathes with air chucks permits work to be loaded and unloaded without stopping the machines, and has cut production time to one-third the time formerly required.

vents the ball rings, which are gripped on the inside, from slipping—as sometimes happens in manual tightening of such a collet.

The cutting tool, which is air fed, is so controlled that it stops after reaching a set point, which eliminates possible damage if the operator does not return to the machine by the time the cut is completed. The spindle speed on these machines is 360 r.p.m., and the feed is approximately 0.012 inch per revolution. The spindle is driven by an electric motor. These machines were devised at a time when it was impossible to obtain lathes for this operation, and have paid for themselves dozens of times over. This one group of four machines is still in operation and doing a good job.

The economies obtained by air chucking and by means of the air-actuated feed are so marked that this

combination has been applied to a number of the pieces of equipment in this shop. These applications were developed by Charles L. Kessler, who is the owner and manager of this company.

A rear view of the machine is shown in Fig. 5, where the operator can be seen loading one of the machines. As can be seen in the illustration, there are three cylinders on the rear of each

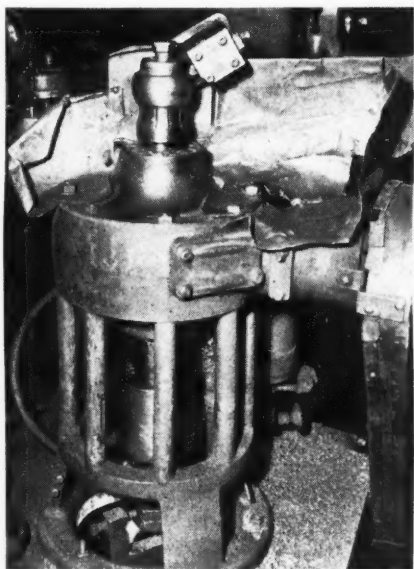


Fig. 4—Close-up view of one of the spherical turning machines, showing the air-operated collet and air-actuated cutting tool for the rough cutting operation on ball rings. Devised by Charles L. Kessler, owner of the plant, the machine was built from a Nash automobile rear end. There are four of these machines in the battery.

Fig. 5—One operator runs the battery of four spherical turning machines. The air-actuated piston which controls the feed is controlled by the flow of oil in two cylinders, one on either side of the air cylinder.



machine, the piston in the middle cylinder being actuated by pressure of oil from the other two cylinders. The finished turning operation on the ball rings is performed on a Cincinnati Milling Machine equipped with a "Senacon" power feed, which is controlled by a Senacon "Hydro-Check." The Senacon feed operates on air line pressure and will develop a feed pressure up to approximately five times the air line pressure. The device feeds in either direction, the rate of traverse being controlled by two adjustable speed control valves. Vernier control is provided for accurate adjustment of the stroke length. This Senacon power feed, made by Smith-Johnson Corporation, Los Angeles, California, can be adapted to practically any type of machine tool. In the operation shown in Fig. 6, the boring ring is finish turned to limits of $\pm 0.001 - 0.000$ inch in a single cut. The collet chuck makes it possible to chuck and remove the work in a single quick movement, and the fast operation of the Senacon power feed facilitates resetting of the tool. By adapting this finish turning operation to a milling machine, all possible vibration is eliminated and a

smooth job is obtained.

An internal grooving operation is performed on the ring with the machine shown in Fig. 7. This machine is an old lathe to the carriage of which a boring bar has been anchored, carrying a carbide tool for the grooving operation.

The ball ring is chucked by slipping it into a fixture which is bored to the finished dimension of the ball, where it is held by means of a retaining ring which locks over four pins, as shown in the illustration. A rotating air cylinder in the spindle of the machine drives a piston forward against the rear side of the ball ring, gripping it between the end of the piston and the retaining ring. The boring bar is actually an air piston which is fed into the work, stopping at the correct point. The operator then feeds the tool into the interior of the work by means of the cross-feed, guiding it to the

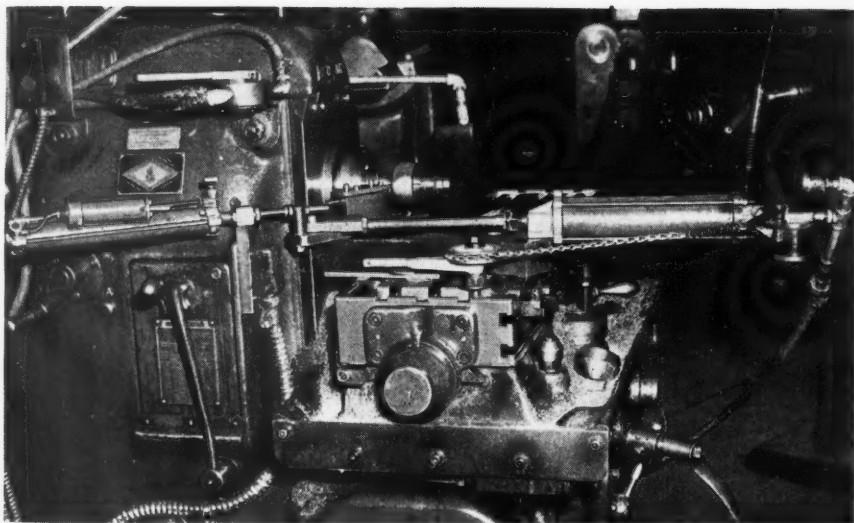


Fig. 6—The finished turning operation is performed on this Cincinnati Milling Machine, which is equipped with a "Senacon" power feed, controlled by a "Hydro-Check." The tool is fed by pneumatic power; the rate of feed is controlled by hydraulic power. This device provides any rate of feed required, and the quick operation of the device eliminates non-productive time.

proper depth by means of a dial. Upon completion of the grooving operation the tool is fed clear of the work, the air pressure is reversed, and the bor-

ing tool is returned to its original position. At the same time the piston which holds the work in position is retracted. The retaining ring is then loosened by turning it slightly, and the work-piece is removed. This application of air to the clamping arrangement and to the boring tool feed has enabled the shop to turn out parts four times faster than was possible by the previous hand loading methods.

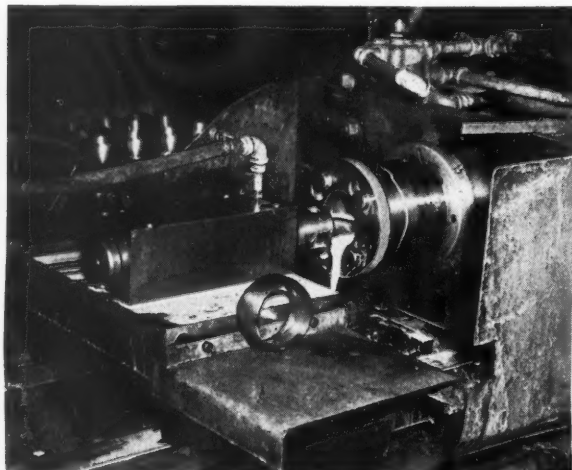
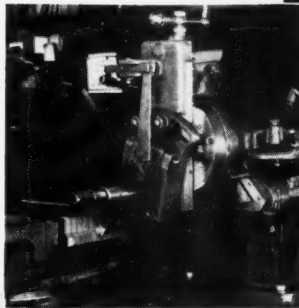
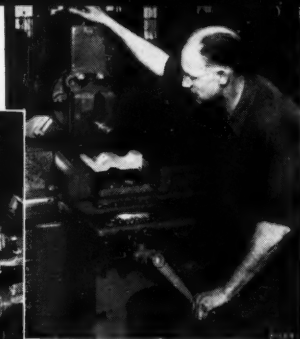


Fig. 7—A grooving operation on the interior of the ball ring, performed by equipping an old lathe with an air-operated piston for clamping the work, and an air-controlled boring tool.

Power down feed speeds
vertical facing and slotting.

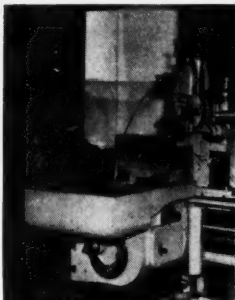


Supplementary
table top for
extra large
clamping space



Auxiliary front cross feed is
very helpful for developing
contours.

The Cincinnati automatic tool
lifter is essential for carbide
tools and high speeds.



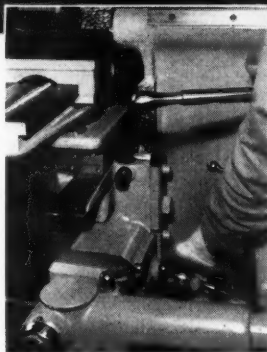
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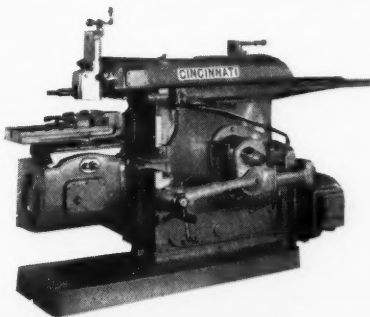
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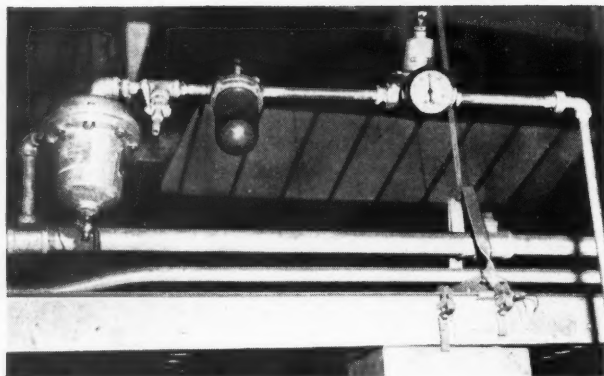


Fig. 8—Clean, dry air for the operation of the pneumatic device is assured by the use of a filter, lubricator and regulator for each machine.

To insure the proper operation of all of this air-operated equipment, it is necessary that the air be clean and dry—for which the company takes ample precautions. All connections from the feeder lines to the machines rise approximately six inches above the main air line and the air is then passed through a filter, lubricator and regulator, as shown in Fig. 8. The shop air

line carries 100 lb. per square inch pressure, and the regulator holds the air to the steady pressure required for the applications previously described.

Chucking pressures range around 40 lb. per square inch, varying somewhat according to the operation. Air is supplied to this work by two compressors, shown in Fig. 9, which are located in a corner of the shop, out of the shop area, and in a position where clean intake air is assured. The two-inch main line from the compressors slopes down to an automatic pop-

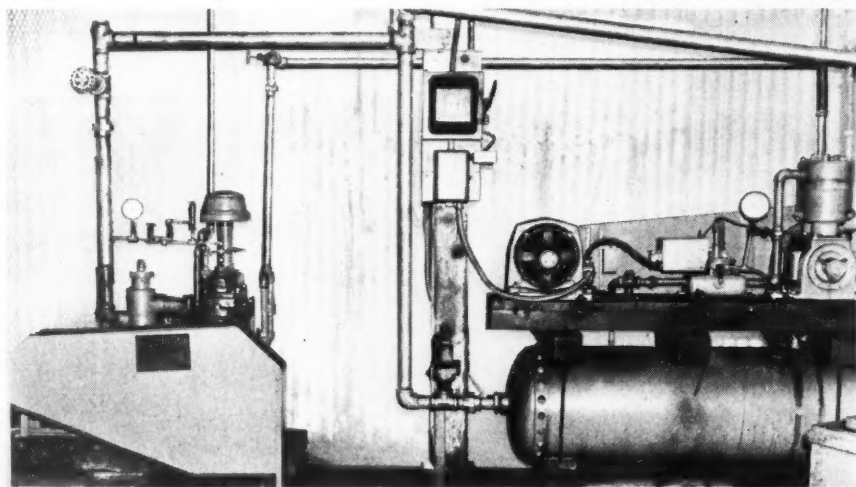
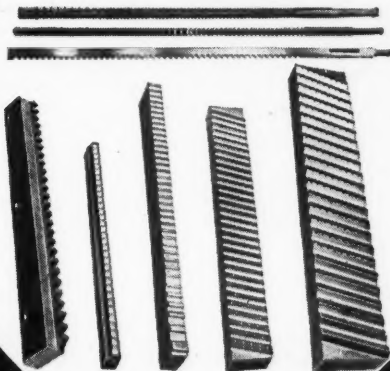


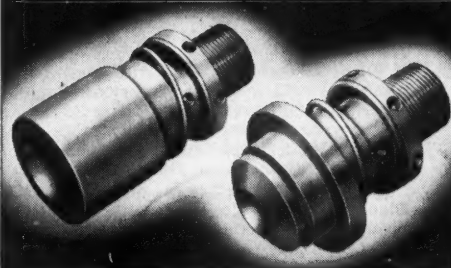
Fig. 9—An ample supply of compressed air is assured by the use of two air compressors, both of which are duplex, single-stage units. The larger compressor supplies air for all usual requirements, the smaller unit serving as a standby, and cutting in only when the air pressure drops below a predetermined point.

American BROACHES

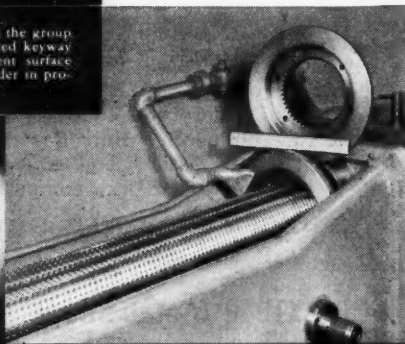
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pet valve which traps the moisture. Then, before entering the feeder lines, the compressed air goes through a filter trap. One-inch feed lines extend from the main line, rising six inches in 100 feet, as mentioned before, so that any moisture in the lines will flow back for draining.

The two air compressors are coupled together so that they work together to build up pressure. When the proper pressure is obtained, the smaller of the two compressors cuts out. If the demand is greater than the one compressor can supply, the smaller unit cuts back in. Both of the machines are duplex, single-stage units. The larger one is driven by a 7½ h.p. motor. Together the compressors supply enough air to also supply a sheet metal shop in an adjoining building.

The necessity for production at a price which will keep a plant in business in a competitive market has replaced the urgency of quantity production for victory. In meeting the urgent demand for war production by devising the compressed air applications described here and adapting to his use the commercial controlled air power feed, Mr. Kessler has gone a long way in meeting today's competitive conditions.

The 1948 Metal Show

A "Salute to Alloy Steel", in celebration of the seventy-five years of progress made in alloy steel, will be the central theme at the National Metal Congress and Exposition when the American Society for Metals holds its 30th annual convention in Philadelphia, October 25-29.

Principal features of this diamond jubilee for alloy steel will be: (1) A program of technical and historical papers about alloy steel. (2) Presenting of "Distinguished Service Awards" to individuals who have made outstanding contributions to the progress and development of alloy steels. (3) A dramatization of the part played by alloy steels in the history and development of our country. This third

feature will include graphic evidence of the dependence of the American economy on alloy steel as well as the progress of alloy steels in relation to the engineering, research and technology utilized in its development.

Three important committees, in each case composed of men who represent both the producing and consuming industries in alloy steel, have been chosen to work out the program of the celebration. One committee, consisting of presidents of steel companies and manufacturing associations—the latter covering Aircraft, Automotive, Electrical Equipment, Farm Equipment, Machine Tools, Petroleum, Railroads and the Iron and Steel Institute—will serve with representatives of Government, all large users of alloy steels, as the honorary committee.

The second committee will act on the awards to living individuals who can justifiably be honored for their contributions to the progress in the realm of alloy steels. This committee will consider nominations submitted to it and select the outstanding men in all branches of alloy steels.

The third committee's responsibility will be that of dramatizing the history and progress of alloy steel through a visual display of products, applications and services. The last named feature of alloy steel's diamond jubilee will include a dramatic display of alloy steel products, illustrating the use of these important steels in providing much of the higher living standards we now enjoy.

In commenting on the diamond jubilee of alloy steels, W. H. Eisenman, National Secretary of the American Society for Metals, pointed out that the Society's thirty years of service to the metals industry have paralleled the period of greatest advances in alloy steel.

"The 20,000 members of ASM" Mr. Eisenman said "are representative of the producers and consumers of alloy steel, and for that reason we are indeed pleased to assist in making this salute to alloy steels a deserved tribute to the many companies and their metallurgists who have made it a major factor in our National progress."

The Metal Congress and Exposition, of which the "Salute to Alloy Steel" is to be the central theme, will provide thousands of visitors to the October Convention with a spectacular display of many new developments in all phases of metallurgy. Many new products and processes will be shown for the first time during the Congress and Exposition, according to the ASM announcement.



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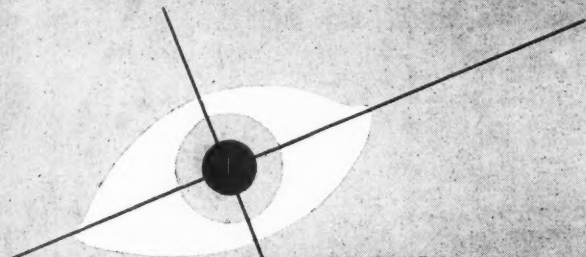
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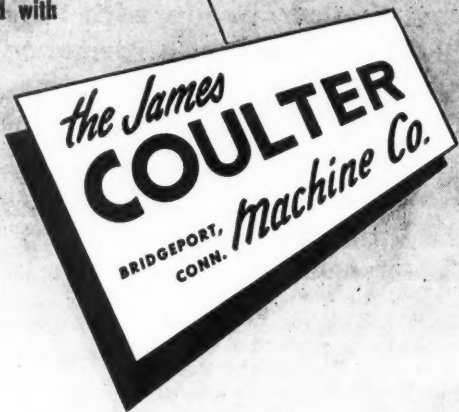


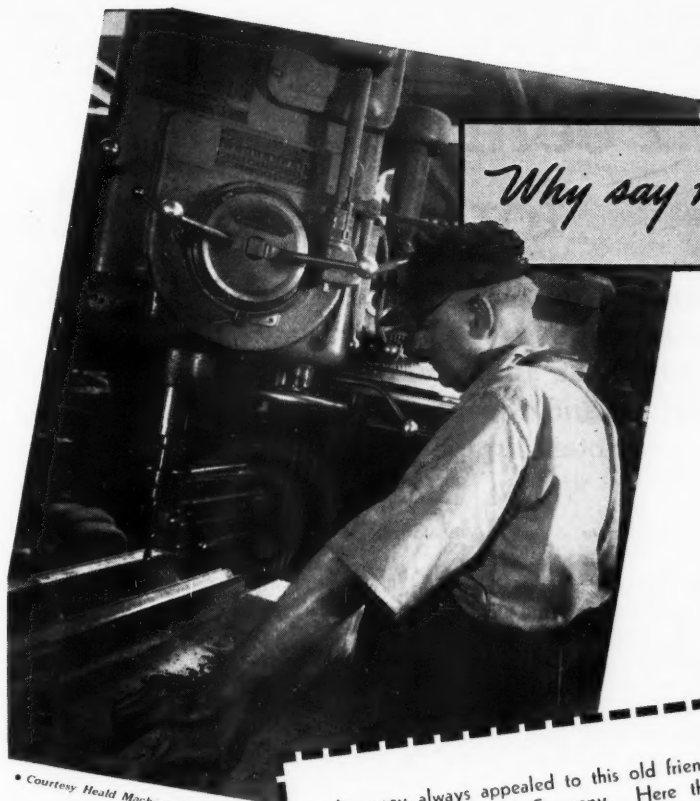


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Shot Peening for Longer Life

Case histories reveal that shot peening can be used to increase the fatigue life of a wide variety of workpieces.

In this article the author discusses the equipment employed and the procedure to follow for obtaining the best results.

By L. J. WIESCHHAUS

Research Engineer, American Wheelabrator & Equipment Corporation

COLD working the surfaces of metals in order to improve their physical properties is as old as the metal working industry itself. In recent years, however, a new method has been developed for extending the advantages of cold working to a much wider variety of parts and doing it on a production line basis. In this new process, known as Shot Peening, the work is subjected to a rain of round, metallic shot hurled at a relatively high velocity.

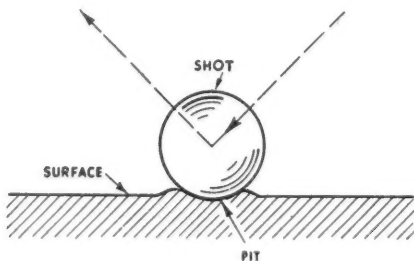


Fig. 1—Drawing illustrating action which takes place when metal surface is hit with shot.

Each shot acts as a tiny peen hammer, making a small dent in the surface of the metal and stretching the surface radially as it hits. An illustration of this action is shown in Fig. 1. The rain of shot causes the surface fibers to flow beyond their yield point in tension, in a layer that extends below the surface to a depth dependent upon the peening intensity, material being peened, and so on.

The fibers underneath the top layer, however, are not stretched to their yield point and, therefore, retain their elasticity. The under fibers are, of course, bonded to the stretched surface layer and after the peening action the inner fibers restrain the outer fibers to a shorter length than that which they would tend to assume. In the equilibrium which results, the surface fibers are in a residual compression while the inner fibers are in tension.

Experimental work has indicated that the surface compression may be several times greater than the tension stress in the interior of the section; so that when working stresses are ap-

plied that would ordinarily impose a tension stress on the surface, that tension is appreciably reduced by the residual stress on the surface layers. And since it has been found that fatigue failure generally results from tension stresses, not from compressive stresses, the net result is considerably greater fatigue life. In general, it may be said that shot peening will lengthen

Most data that has been published on the subject has been reported in terms of increased fatigue life and it should be borne in mind that this increase is affected by many factors including the peening technique used and the stress range at which the part is tested.

If we consider a typical S-N curve, as shown in Fig. 2, we see that as the

Table I—Test Results Reported on Various Shot Peened Parts

PART	MATERIAL	Percent Life Increase	REMARKS	
Connecting Rods	Aircraft articulated rods	106	Reversed torsion 80,000 PSI	**
Connecting Rods	Aircraft articulated rods	63	Reversed torsion 90,000 PSI	**
Crankshafts	Forged steel	50 - 100		**
Gears (pinion)	NE-9420	420	Non-peened gears fractured down into the root while peened gears showed a smoother break at root line level.	*
	MD-4815	85		
	NE-8724	44		
	A-4032	208		
Gun Hammers	SAE-4615	350		*
Gun Hammers	SAE-4620	200		*
Valve Rocker Arms	Pearlitic malleable iron	320	Out of 12 tested, 11 had not failed at end of test.	
Coil Springs	Chrome-silicon steel			
	61-63 Rc	5500	Only 4 tested	**
Coil Springs	Oil tempered chrome-silicon steel. 53Rc before coiling	2000	21 springs tested	**
Torsion Bars	NE-9262	600	Peened before presetting	**
Steering Knuckles	A-4042	350	Only 4 tested. No failures at end of test	**
Sway Bars	SAE-1095	210	All failures in peened specimens occurred in areas masked from shot blast	*
	SAE-1065	140		
Fatigue Specimens (R.R. Moore)	25 S-T Aluminum alloy	1300	Intensity—.018A2	
		150	Intensity—.006A2	**
Test Bars	Armasteel	3000	No failures at end of test	**

* SHOT PEENING, 3rd edition, American Wheelabrator & Equipment Corp.

** National Defense Research Committee Report (NA-115).

the life of any part that is subject to bending or twisting stress.

Shot peening has been applied to a wide range of parts and has produced results that at times have appeared almost phenomenal. Table I lists some of the fatigue life improvements that have been reported in the literature on a wide variety of shot peened parts. These figures cannot be taken as average or even representative benefits because of the wide variations in operating conditions and requirements for each specific application. However, they will serve to illustrate some of the results that have been obtained by means of this process.

stress decreases the life increases at a geometrical rate. As the stress approaches the knee of the curve, a condition exists where a very small change in stress will cause an indefinitely large change in life. When we consider that shot peening has the effect of raising the "knee" of the curve, we can readily see where it would result in extraordinary large fatigue life increases for any parts tested in this range of stress.

In addition to these increases in fatigue life, shot peening has been used to inhibit stress corrosion cracking, reduce leakage due to porosity in metals, test the adhesion of silver

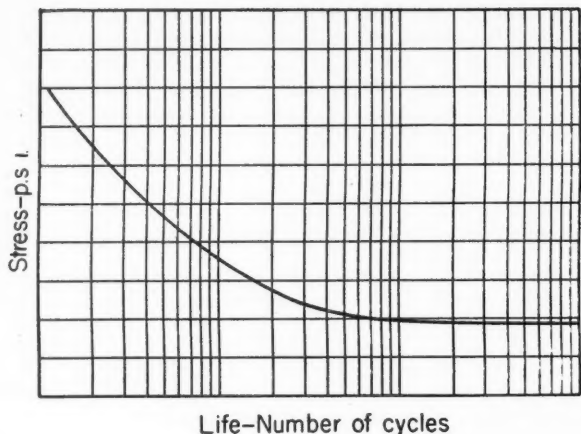


Fig. 2 — Graph depicting a typical S-N curve.

plate, improve the lubrication properties of bearing surfaces and many other uses.

Effect On Design

It is difficult to state what effect this greatly increased life will have on the design of frequently stressed parts but it seems obvious that its influence will be considerable. Here are some of the possibilities that have been considered:

The size and weight of parts can be reduced with a consequent savings in material. In some cases this would result in other important advantages, as in the case of automotive springs where a reduction in size means a reduction in unsprung weight.

Inexpensive steels may, in some cases, be substituted for the high priced alloys that previously were necessary. A typical example of this occurred in the wartime production of steering knuckles. The steel normally used was X-3140. When this steel became unavailable, SAE-4140 was used, but this in turn became unavailable and a new steel, NE-8744 was tried. In fatigue tests on this new steel, tests on the average and high values were satisfactory, but some low results were obtained. Shot peening the areas of stress concentration was then resorted to. The low fatigue life figure for this one selective stress rose to 639,000 cycles against a maximum with the X-3140 knuckles of 241,000 cycles.

The National Defense Research Committee has reported test results

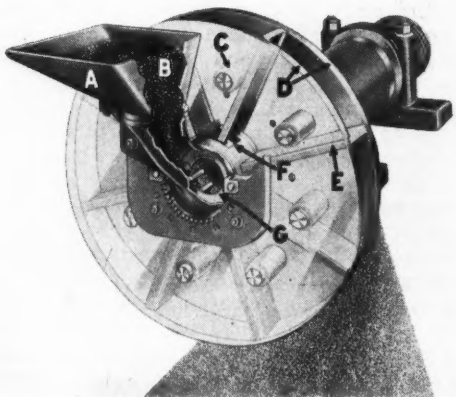


Fig. 3 — Phantom view of the Airless Wheelabrator. Key to Parts: A—Shot funnel; B—Shot; C—Spacers between side plates; D—Special steel side plates; E—Cast alloy blades (removable); F—Cast alloy control cage (Stationary in Operation). Change in direction of blast stream can be obtained by turning the control cage, which changes the position of the opening. G—Cast alloy impeller. (Rotates with Wheel).

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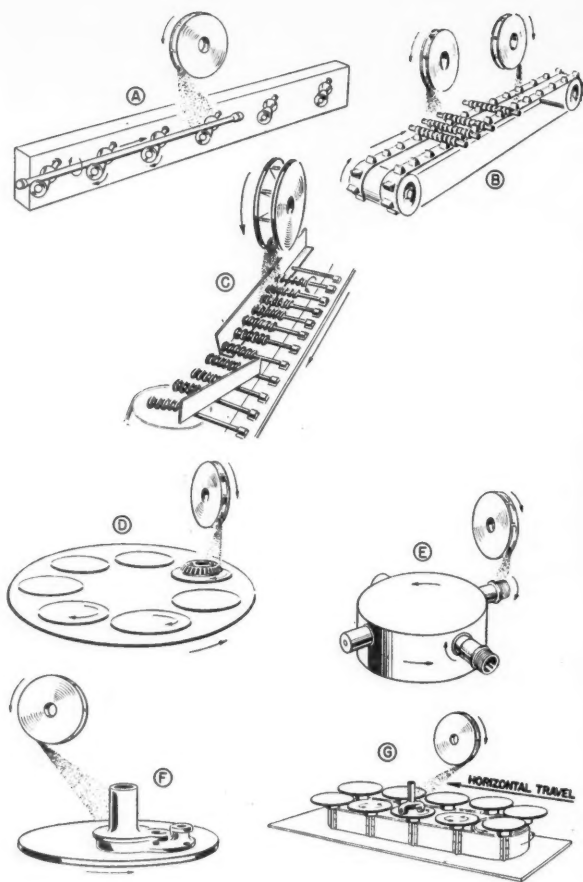


Fig. 4—Methods of handling various types of work in specially designed shot peening cabinets.

ling a given shot peening problem will depend in large part upon the requirements of that specific problem. One of the first questions that arises is the method of propelling the shot against the work.

At the present time, two methods are in common use and each has its own advantages and limitations. The older of the two methods uses compressed air to force the shot through a small nozzle or orifice against the part to be peened. This type of equipment has found its largest application in those cases where it is desired topeen the inside of deep holes and cavities or for a limited amount of production on a large variety of parts.

which indicated that carburized gears made of SAE-1020 steel (shot peened) would last as long as carburized SAE-4620 gears unpeened.

The effect shot peening will have upon the design of any particular part will depend upon the preferences of the individual engineers concerned as well as upon various economic factors peculiar to each individual industry. The advantage, however, is there to be used as the individual sees fit.

The choice of equipment for hand-

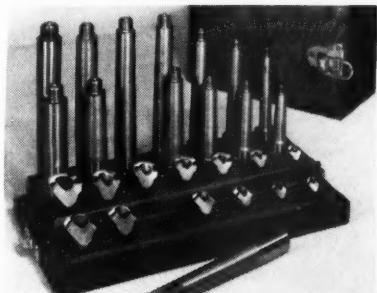
Airless blast equipment on the other hand, finds its widest application in high production jobs involving the peening of large quantities of a similar or identical parts. In this equipment the shot is thrown by a bladed wheel similar to that shown in Figure 3. The propelling force is a combination of tangential and radial forces, eliminating the need for compressed air and reducing power costs.

The next important question is that of choosing the work handling method

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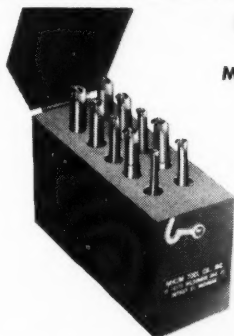
Here are standard sets of boring tools that provide an unusually wide range of hole diameters and depths.



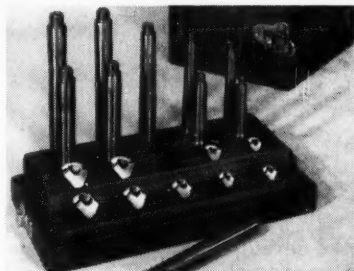
TO FIT 1" CHUCK, set J-1016 contains individual Bokum Boring and Facing Cutter Heads from No. 4 to 10, with 1 set each of standard and extra long shanks.

Hole diameter range: $\frac{1}{16}$ " to $\frac{1}{2}$ "
Maximum depth range: $7\frac{1}{4}$ "

TO FIT $\frac{3}{4}$ " CHUCK, set J-812 has similar Bokum Cutter Heads from No. 4 to 8 with standard and extra long shanks.



Hole diameter range:
 $\frac{1}{16}$ " to $3\frac{3}{4}$ "
Maximum depth range:
 $6\frac{1}{4}$ "



Both sets contain a $\frac{3}{8}$ " adaptor for use of smaller tools (as shown in box at left). Thus bringing boring range of diameters down to $\frac{1}{16}$ " holes.

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best adapted to the particular problem at hand. Since consistent results require the utmost uniformity in the peening operation, it is obvious that considerable care must be taken to assure that each piece has its highly stressed areas exposed to the shot blast in the same manner and for the same length of time.

This strict requirement has led to

Rotation of the work about a horizontal axis, with horizontal travel at right angle to the axis of rotation is illustrated (4C) in the peening of valve springs. The work is mounted on steel bar fingers fitted to an endless rubber conveyor belt. The springs are held on the fingers by an angle guide which also serves to rotate the springs as they pass through the blast zone.

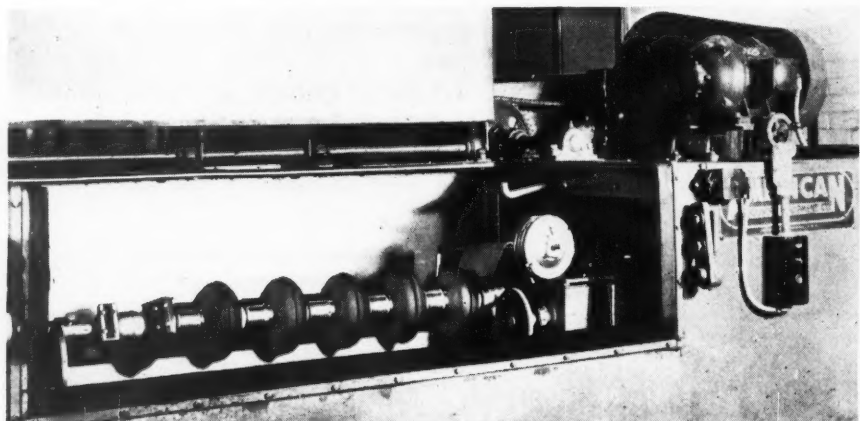


Fig. 5—A special cabinet installed at Curtiss-Wright Corp., Propeller Div., Indianapolis, Indiana, for peening the threads and thread reliefs on variable pitch propeller gears. Ten gears are mounted on an arbor and the gear teeth are masked during the operation. Note the two Almen Test Strips mounted on the left end of the arbor.

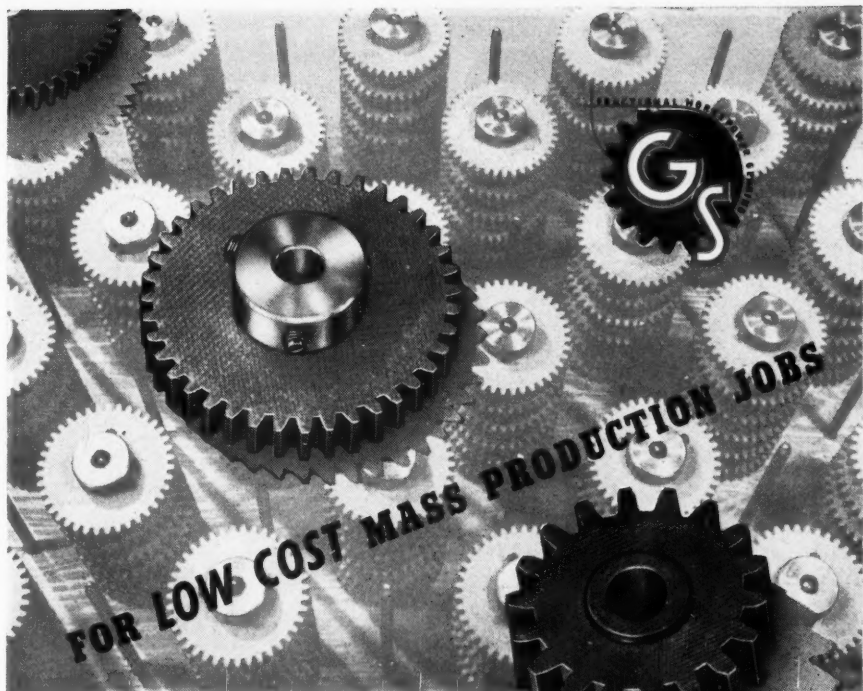
the development of many specially designed work handling methods. Figure 4 serves to illustrate a few of the more common of these methods.

The peening of torsion bars (4A) illustrates the rotation of work about its horizontal axis with straight line travel parallel to the axis of rotation. The work is rotated and carried through the blast stream by a series of skewed, dished rolls.

Straight line travel with no rotation is illustrated in Figure 4B. In this case, the problem was to shotpeen the two milled ends of tank tread pins. The pins are held in position on an endless rubber belt conveyor by means of special clips.

Rotation of the work about a vertical axis, with circular travel, is typified in the peening of bevel gears (4D). The work is placed on rubber covered tables which are carried on a circular path through the cabinet. The tables revolve automatically as they travel through the blast zone.

The shot peening of aircraft engine cylinder barrels provides an example of rotation of the work about a horizontal axis (in indexed position). See Figure 4E. The work is mounted on rubber covered spindles which are fitted to a cylindrical turret. An automatic timing and indexing mechanism controls the movement of the turret, successively bringing each of the spin-



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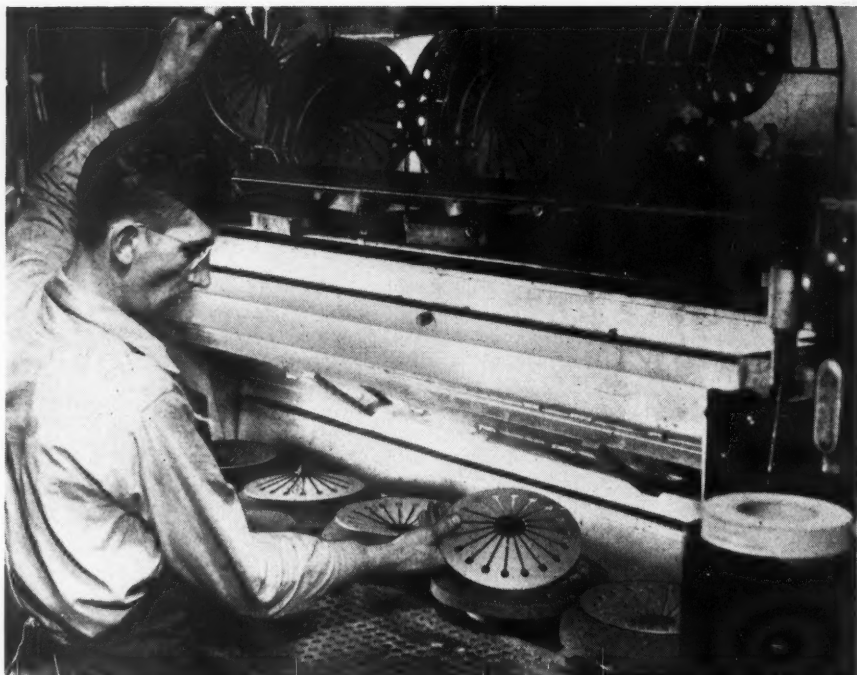


Fig. 6—Cleaning and peening clutch plates. This is an example of rotating the work about a vertical axis with straight line travel. The plates are given one pass and then turned over and given another pass to provide full coverage on both sides.

dles into the blast zone and halting it there for a predetermined time while the spindle is rotated.

The differential hub shown in Figure 4F provides an example of rotating the work about a vertical axis (in indexed

position). The hub is located in the exact center of the table so that the fillets will be peened uniformly.

Rotation of the work about a vertical axis, with straight line travel, is illustrated in peening the fillets of a



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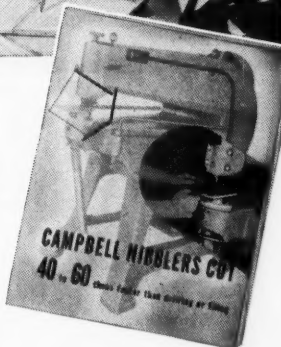


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steering knuckle (4G). The work is mounted on rubber covered tables which rotate as they travel through the blast zone in a horizontal plane. This permits concentration of the blast stream on an area that coincides with the center line of the table.

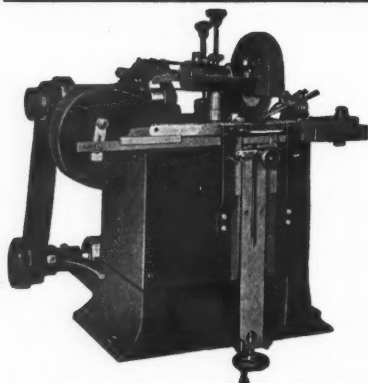
These work handling methods will probably take care of the majority of peening applications but it is still frequently necessary to design special fixtures and devices for handling the work. Figures 5 and 6 illustrate some of these special fixtures. Except in those cases where the item to be peened is reasonably simple, or where past experience points the way, the safest procedure for determining the correct equipment is to stage tests in the laboratory.

For consistent results and maximum economy it is of paramount importance that broken shot be removed from the machine and new shot be added continually during the peening

operation. The fatigue life improvements obtained by shot peening are dependent to a large extent upon the intensity of the blast which in turn is dependent upon many factors including shot size and shot velocity. Since all of the shot particles leave the wheel at approximately the same velocity, it will be seen that uniformity of shot size and weight is extremely important if a uniform intensity is to be maintained.

It is for this reason that shot separators are recommended and supplied with all shot peening equipment. Figure 7 illustrates a "closed air cycle" shot separator which uses a carefully controlled flow of air to separate the "fines" from the whole, usable shot.

Incoming shot flows down an inclined shed (A). The hinged, weighted gate (B) insures an even distribution of shot across the shed and, at the same time, permits the flow of shot to vary according to the amount being



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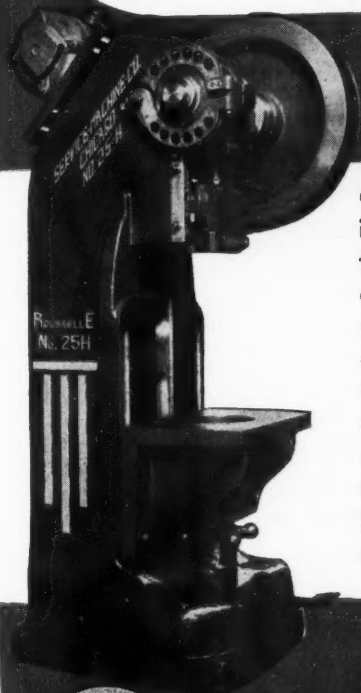
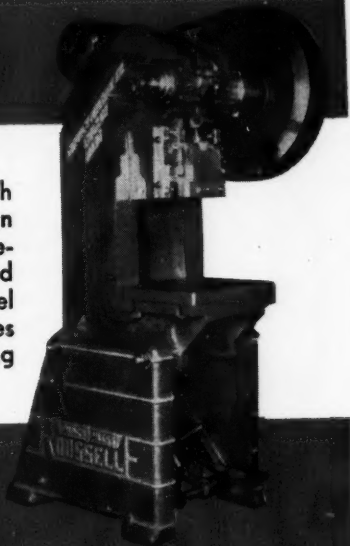
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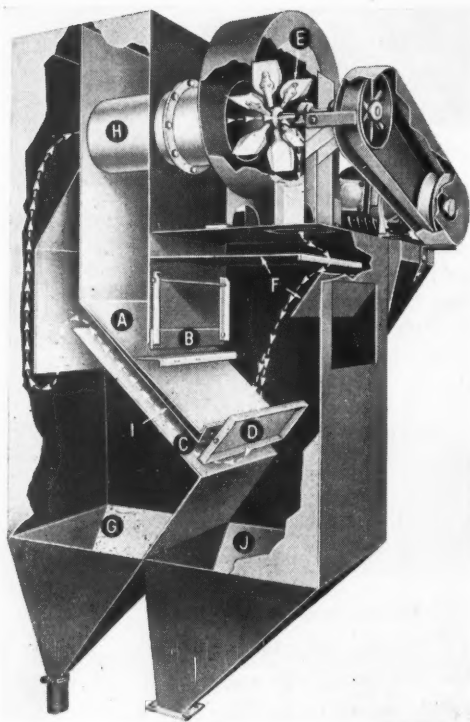


Fig. 7—Cut-away view of the shot separator. Key to Parts: A—Inclined shed; B—Hinged gate; C—Outlet for broken shot; D—End baffle; E—Fan; F—Air baffles; G—Settling chamber for broken shot; H—Fan inlet; I—Adjustable baffle; J—Storage hopper.

it settles out as a result of impingement on baffles and of the decrease in air velocity. The relatively clean air then passes upward to the fan inlet (H) and is recirculated.

Usable shot is unaffected by the air stream and drops by gravity into the storage hopper (J) for reuse in the Wheelabrator unit. The importance of proper adjustment and care of the shot separator can not be over emphasized if uniform, economical operation is desired.

An automatic shot adding mechanism is used to replenish the system with fresh shot to offset the broken shot removed by the separator. This mechanism is adjusted to add shot at the same rate it is breaking down and it should be checked periodically to assure proper balance in the system.

Careful consideration should be given to the question of the size of shot to be used in the operation. This will be influenced by several factors including the peening intensity and cov-

recirculated. End baffle (D) forces all shot to pass directly past the opening (C).

An air current coming from fan (E) passes through the baffles (F) and carries all particles lighter than a predetermined mass, through the aperture (C) to compartment (G) where

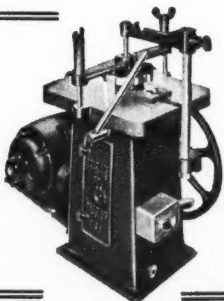
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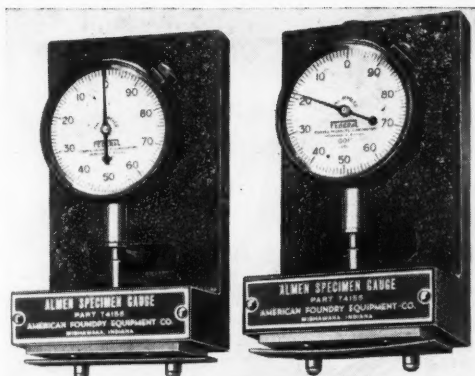
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Fig. 8 — The No. 2 Almen Specimen Gage for measuring arc height of Almen Test Strips. This illustrates the method of reading the arc height produced on the strips by the shot blast.

erage desired, shape and size of the part and the production rate required and will usually be determined on the basis of tests conducted prior to the installation of the shot peening equipment.

Some type of a dust collecting system is needed to collect the fines created during the shot peening operation and remove them from the working area. This of course need not be a separate installation and the peening equipment may be vented to any dust collector system installed in the plant provided it has the extra capacity necessary.



The Almen Gauge

It has been pointed out earlier that for uniformity of results it is vitally important that the peening intensity be maintained at as uniform a figure as possible. Once a uniform blast has been established, it can be checked periodically by means of a special



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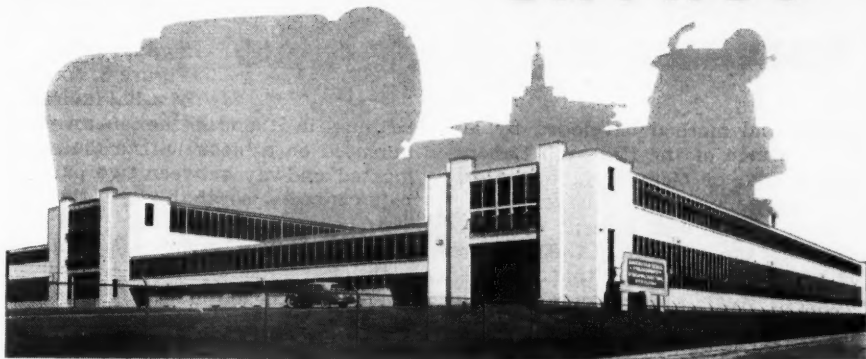
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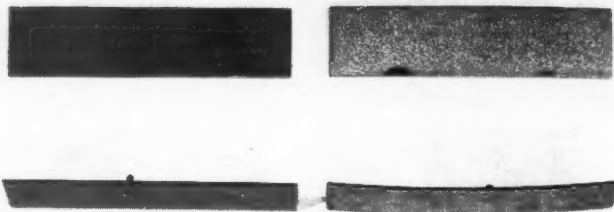


Fig. 9 — Almen "A" Strip before and after shot peening.

gauge and method developed by Mr. J. O. Almen of the Research Laboratories Div. of General Motors Corp. This gauge and method have been accepted as the best present means of checking the intensity of the blast and is based upon the fact that if a thin strip of steel is shot peened on one surface only it will assume a curved shape. The amount of this curvature is related to the effective intensity of the blast and is measured by the Almen gauge.

The Almen No. 2 gauge, shown in Figure 8, consists of a dial indicator, reading in thousandths of an inch, mounted on a block with a dial stem located midway between two pairs of ball contacts, so that when the test strip is placed against the contacts the dial registers a combination of arc both longitudinally and transversely on the strip. This gauge measures the arc height on the concave, smooth side of the strip so as to eliminate from the measurement any variation due to the peened surface roughness.

There are two sizes of Almen test

A Necessity

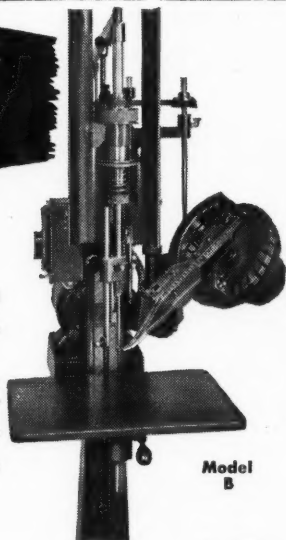
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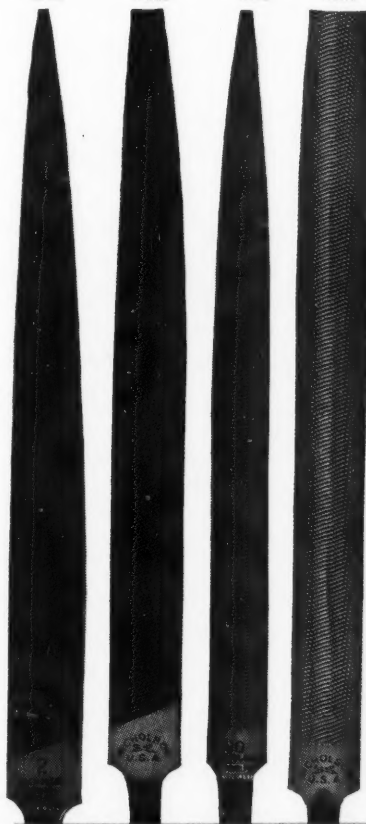
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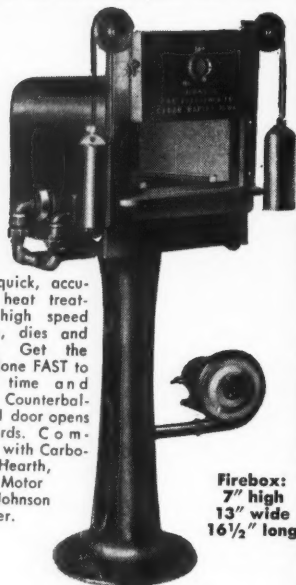
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gauge No. 2

Ends only may be shear finish. Remove burrs and break corners. For heavier work the "C" test strip is used. This has the same specifications as the "A" strip except for the thickness which is .0938 in. \pm .001 inch.

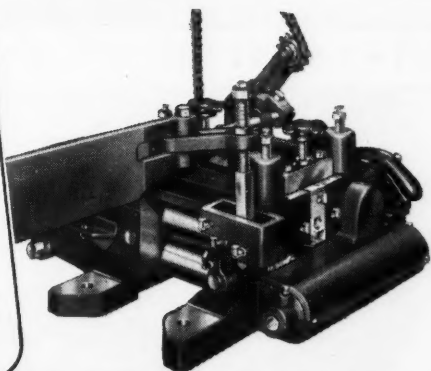
The measurement of arc height is usually expressed by the gauge reading in inches followed by the suffix "A-2" or "C-2" to designate the type of strip and gauge used. Thus .013 A-2 represents an arc height of .013 inch as measured on an "A" strip by the Almen Number 2 gauge.

In practice, the test strips are mounted on a steel block, 3 inches long by 1½ inch wide by ¾ inch high where it is held in place by 4 round head screws. The blocks may be fastened to the work handling fixtures in such a way as to approximate the location of the critical areas to be peened. Such an arrangement is shown in Figure 5.

The art of shot peening still suggests many unanswered questions and as our knowledge of the subject increases it seems certain that the process will increase in value to the metalworking industries. But, even in the present stage of its growth, shot peening is bringing real benefits to a long list of manufacturers.

"Rycase" an improved carbon-manganese carburizing steel which is described as having good machinability in addition to developing a hard, deep case with rugged supporting structure, is the subject of a four-page two-color bulletin issued by Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. Data on chemistry, strength, and recommended heat treatment are included. Copy free upon request.

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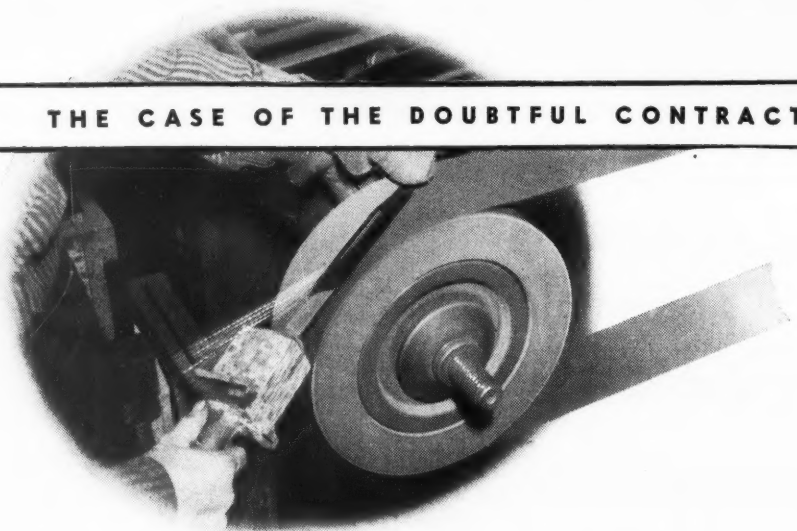
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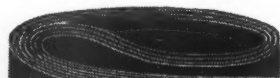
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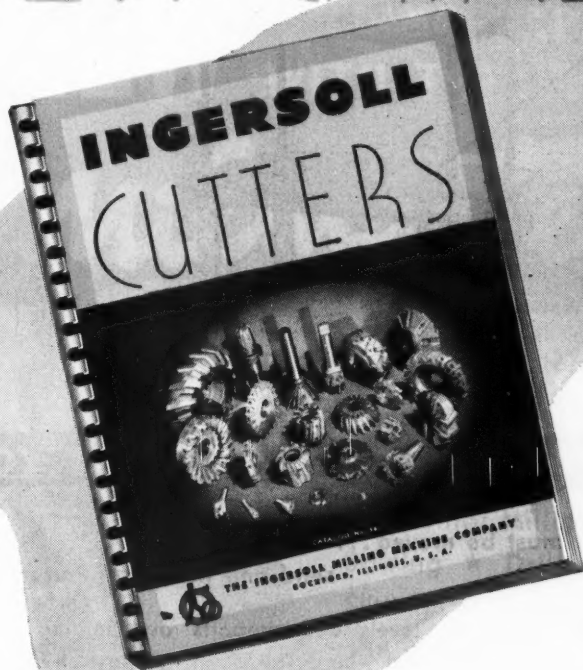
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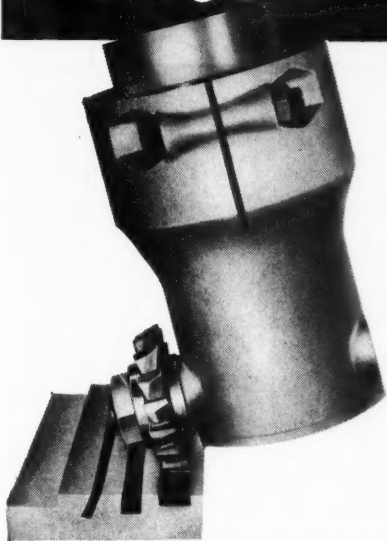
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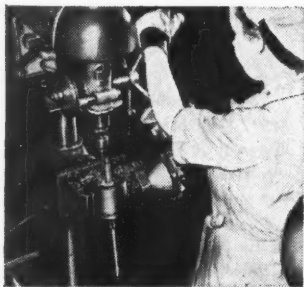
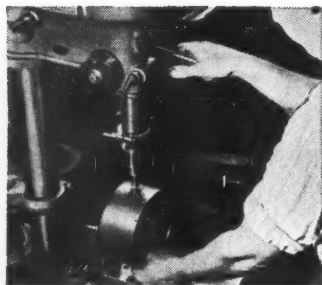
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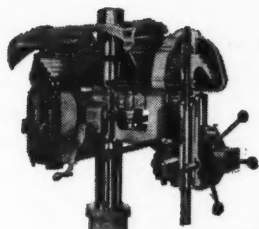


Photo, above right: Turning motor shafts on standard 20" Power Feed Drill Presses.

Photo, upper left: Spinning insulation fibre bushings over steel motor bands with 15" Drill Press.

Photo, lower left: Balancing motor rotors with 15" Drill Press. Depth Gauge Indicator shows amount of metal to be removed for correct dynamic balance.

**Photo, upper right:* 20" Power Feed Drill Head, Model D-1101X. 4 ball bearings, 6" spindle travel. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Capacity 1" in cast iron, 3/4" in steel. Slo-speed motor optional.



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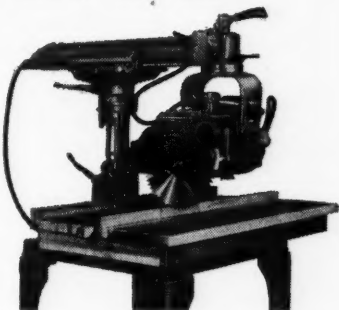
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Monotony in Machine Shop Work

The monotony to which is ascribed so many of the evils of our present industrial system, is the attitude of the individual, not of the system.

By ALBERT W. GRAY

THE popular condemnation of repetitive work in mass production as the curse of modern efficiency, the creator of robots from workmen and the destroyer of human values and individuality rests on conclusions of no scientific basis. Such denunciations suggest the cynicism of Samuel Butler in his *Apology for the Devil*, "It must be remembered that we have only heard one side of the case."

"I watched a man," writes Arthur Pound in *Iron Men in Industry*, "shove metal rings across six inches of space to a guide from which they were moved automatically through the machine, from which they emerged slotted some seconds later without more human ado. That was his job from morning until night; his pay depended upon the number of slotted rings that passed inspection. Eyes concentrated on his little platform, one hand moving thus, the other so, in unending repetition. He missed not one revolution of the wheels which were grinding out his life, even as they ground out the goods. Economically he was part of the machine—an automatic feeder; he chanced to be flesh and blood and man."

In his *Creative Impulse in Industry*, Marot wrote, "He supplements what-

ever human faculties the machine lacks; he sees for it; he walks for it if it is without legs; and he pulls, drags, lifts, if it needs arms. A worker's indulgence in his personal desires or impulses hinders the machine and lowers his attachment value."

"The lord of the world is becoming the slave of the machine which is forcing him—forcing us all, whether we are aware of it or not—to follow its course. The victor, crushed, is dragged to death by the team," asserts Oswald Spengler.

These popular comments, however, are not scientific conclusions derived from studies of worker attitudes in repetitive work. They are the opinions of observers, writers and dreamers, of how they themselves would feel doing that type of work. They do not describe worker attitudes. They describe their own imagined attitudes in the performance of repetitive work.

"We have begun seriously to question our assumptions surrounding the effect of machine tending on the individual," asserts H. S. Person. "These assumptions were derived principally from the reports of observers who were essentially artists and whose judgments appear to have been influ-

enced by highly colored imagination. Their sweeping generalizations have not been verified by the more numerous and sustained observations of those intimately concerned with industry. Without question fatigue, monotony and other undesirable elements are present in modern machine work but apparently not so much for the workers as for the artists watching the machines being operated."

The lower production rate arising from boredom and its accompanying restlessness, was found by Wyatt and Langdon of the English Industrial Health Research Board, to increase in the middle of a work spell and decline as the end of the work approached. Further, according to Norman F. Maier, of the University of Chicago, the boredom in the afternoon does not exceed that of the morning and declines both before and after any rest periods adopted by management.

In an effort to ascertain the work-

er's attitude toward repetitive tasks rather than the mere imaginings of observers unacquainted with the actual performance of such machine work, Prof. Hugo Muensterberg, psychologist of Harvard University, sought a factory job that in his opinion would be the most tiresome and monotonous possible.

The one most closely fitting this description was the task of wrapping incandescent light bulbs in tissue paper for shipment. The woman at this work wrapped an average of 13,000 lamps a day. Each lamp demanded 20 finger movements and 42 to 44 seconds of time. She had been employed at the task 12 years and in that time had wrapped approximately fifty million lamp bulbs.

She assured Muensterberg she found the work really interesting. That above all there was a continuous variation. Sometimes she grasped the lamp or paper in a different way; sometimes

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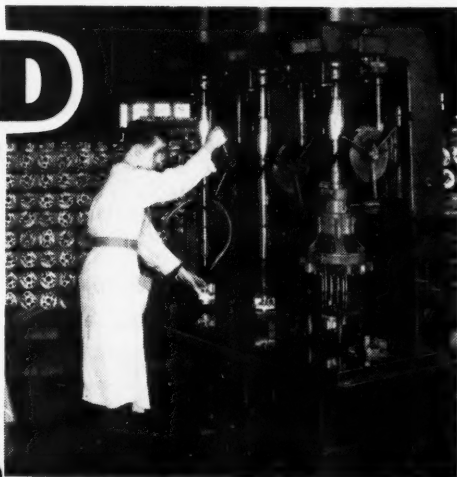
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"She found the work really interesting."

the packing itself did not run smoothly; sometimes she felt fresher; sometimes less in the mood for working but that there always was something to think about.

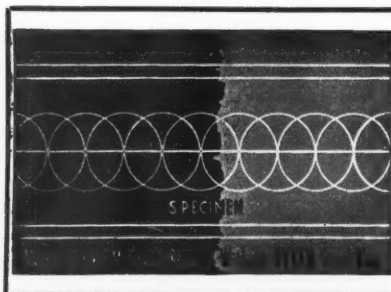
He found this same attitude toward

ment of popular psychology."

The fallacy of the conclusions condemning repetitive work is that the critic fails to comprehend the attitude of the worker towards the task. "If we do not know and really under-

repetition in work in a punch operator, feeding metal strips into an automatic machine, 34,000 uniform movements daily, continued for 14 years. The man, said Muensterberg, appeared an intelligent workman and to him the work was interesting and stimulating.

"I have become more and more convinced," concludes this famous industrial psychologist in relation to this popular condemnation of repetition in contemporary mass production plants, "that the scientific psychologist is not obligated to endorse this judg-



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"The shepherd knows every sheep though the passerby has the impression that they all look alike."

stand the subject we are entirely unable to discriminate the subtler inner differences. The shepherd knows every sheep though the passerby has the impression that they all look alike."

Experiments conducted some years ago by an Hungarian psychologist suggest a key to this wide variation in conclusions relating to the effect of

colors substituted for figures. There a series of identical or similar colors had a tendency to fuse into one impression, blotting out repeated impressions. A more elaborate experiment was conducted by lists of different and similar or identical words. After these lists were displayed to a group of 400 the group was asked for

monotony in mass production. A series of figures were exposed for a fraction of a second to a group of observers. In this series were repeated numbers as well as those listed only once. Asked to recall the figures thus exhibited the answers showed that the repeated figures were seen in many instances only once; the repetitions failing to register an impression in the mind of the observer.

Similar experiments were made at the Harvard Psychological Laboratory with



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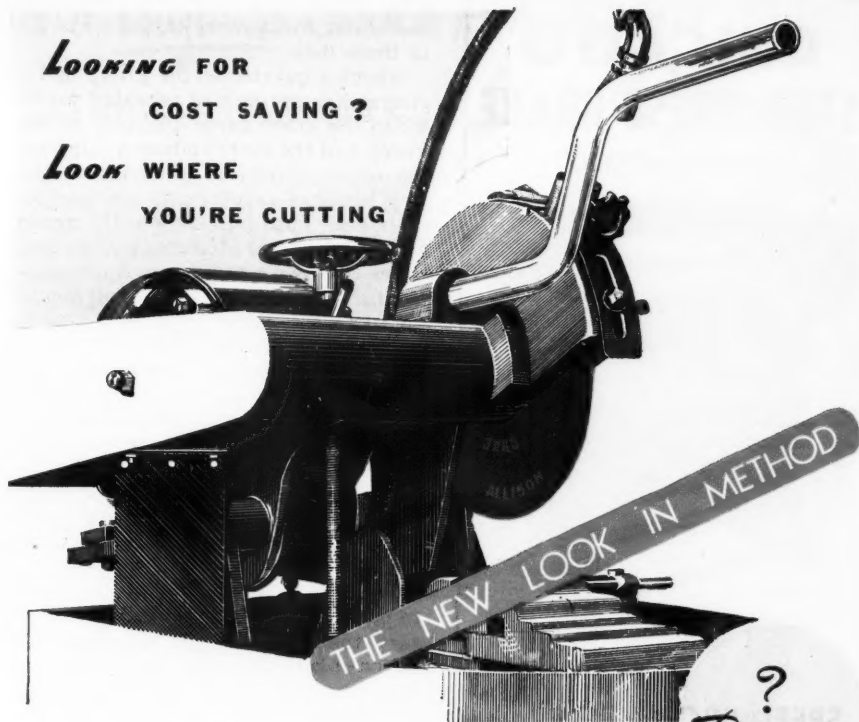
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their impressions of whether different or similar words were in the majority in these lists.

About a quarter of the group had a stronger impression of repeated words while the other three quarters of the group had the more enduring impression of the different or varied words. This series of experiments was supplemented by questionnaires to the group of their personal attitudes and preferences towards repetition and uniformity or variation in daily life, meals, habits, work and so on.

Those with whom repeated words made the stronger impression and were best able to recall repetitions were those preferring routine in their daily lives. Those less able to recall these repetitions were those with an antipathy to routine and systematic activities. Applying this finding to the performance of repetitive tasks Muensterberg concludes:

"If these two groups of persons have to perform a task in which it is necessary that not a single member of a series of repetitions be overlooked, it is clear that the two groups must react in a very different way. Now the perfect perception of every single member of a series is forced upon them. Those who grasp equal impressions easily and who are prepared beforehand for every new repetition by their inner dispositions will follow the series without strain and will experience the repetition without strain."

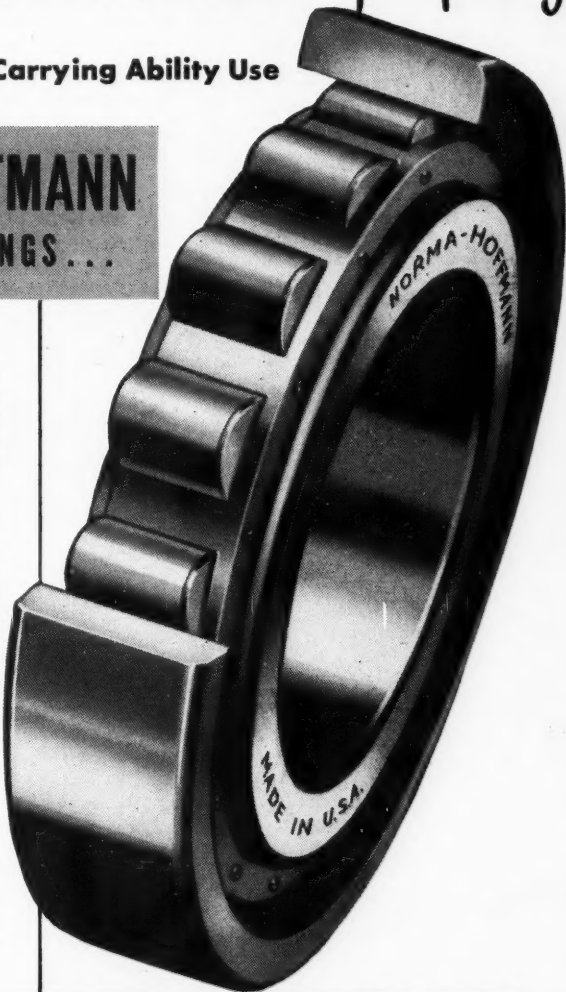
This is the attitude of the woman wrapping the light bulbs and of the punch operator with his little strips of steel. "On the other hand," continued Muensterberg, "those in whom every impression inhibits the readiness to receive a repetition and whose inner energy for the same experience is exhausted, must feel it as a painful and fatiguing effort if they are obliged to turn their attention to one member of a series after another in a uniform series. This mental torture is evident-

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"The amount of boredom experienced by operatives employed in repetition work increases with their degree of intelligence."

ly the displeasure which such individuals call the dislike of monotony in their work."

The conclusion is inescapable. The monotony to which is ascribed so many of the evils of our present industrial system, is the attitude of the individual, not of the system. "It is not an attribute of the work, but an attitude

of the worker," asserts Harold Burt in his *Psychology and Industrial Efficiency*.

The proportion of workers more or less immune to this antipathy to repetitive work can be safely placed at approximately 25 percent. This was the ratio established by Muensterberg. Also in their monograph, "Fatigue and Boredom," Wyatt and Langdon of the Industrial Health Research Board, estimated 3 percent of the average workers practically free of boredom, 33 percent "slightly affected," 38 percent experiencing boredom in a moderate degree, 23 percent suffering acutely and the remaining 3 percent never entirely free from its affect.

Factors correlated to this antipathy to monotonous work, according to this report, are four; (1) intelligence; (2) inability of mechanizing simple manual processes; (3) temperamental tendencies that found satisfaction in contacts with the external world rather than in day dreams and fantasy and, (4) the desire for creative rather than repetitive work.

This study points out further that the more intelligent workers suffer more from repetitive work. The conclusion of the authors is, "The amount of boredom experienced by operatives employed in repetition work increases with their degree of intelligence. Conversely, the individuals who are likely to find the most satisfaction in simple

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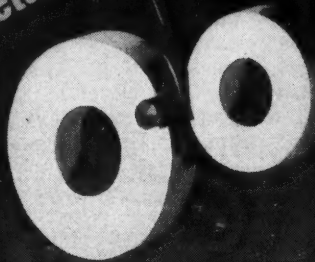
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forms of repetition work are those of a relatively low order of intelligence." A paradoxical feature is that in spite of an aversion to repetition the more intelligent workers exceed the others in the quantity of output.

The solution of this problem of monotony lies in the personnel department. By simple tests it can be readily determined whether job applicants are among the 25 percent substantially immune to the affects of repetitive jobs that bring boredom to the other 75 percent. In addition the more intelligent may be aided in overcoming this attitude by acquaintance with the whole picture of the industrial activity of which they and their activities are a part.

"Teaching employees the meaning of their work," observes Maier, "how it fits into the total picture, how the records are arranged and a number of other details would change much red tape into essential and important activity. Giving employees responsibility of judgment is very effective in accomplishing this end."

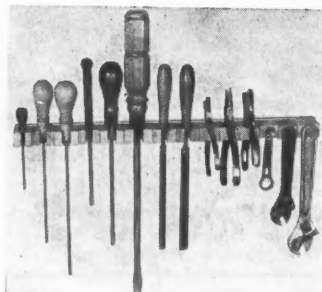
Another factor available for combatting an attitude of boredom is rest periods of ten or fifteen minutes during the forenoon and afternoon spells of work. Records show the decline in production otherwise occurring in the middle of long work periods is thus appreciably curtailed.

"Monotonous activities of the type under consideration," comments Prof.



"Rest periods of ten or fifteen minutes during the forenoon and afternoon."

Elton Mayo of Harvard University, "cause a considerable reduction in output which is most apparent about the middle of the spell of work. This reduction can be avoided to a certain extent by the introduction of rest pauses of 15 minutes duration half



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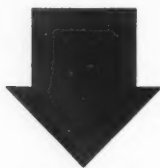
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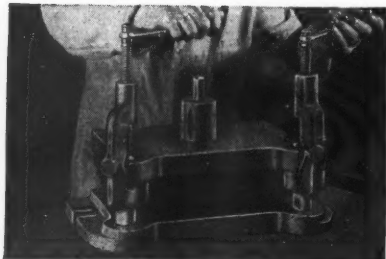
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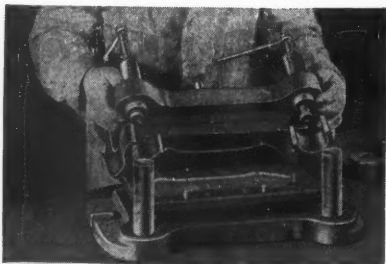
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through the spell. There is an increase in output not only after the rest but also before the rest takes place."

These methods for overcoming this worker attitude are summarized by Wyatt as (1) change in the form of activity of a worker during the periods of work, (2) basing wages on the amount of output rather than on time worked, (3) assignment of work as a self contained task, rather than as an indefinite and indeterminable activity, (4) assigning workers in compact social groups rather than as isolated units, and (5) suitable rest periods.

Most essential, however, is care in the selection of workers. "It is important," asserts Muensterberg, "that labor which involves much repetition be performed by men and women whose mental dispositions favor an easy grasp of successive uniform impressions. Experimentation could secure the selection of fit workmen and the complaint of monotony would disappear. The same selection could be useful in the opposite direction, as many economic occupations, especially in our time of automatic machines, demand quick and often rhythmic transition from one activity to another. It is evident that those whose natural dispositions make every mental excitement a preparation, not for the identical, but for the contrasting situation, will be naturally equipped for this kind of economic task."

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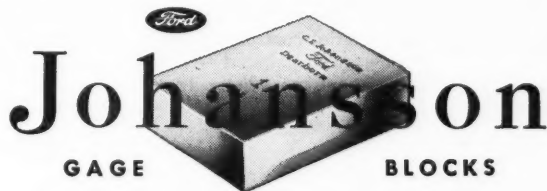
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Progressive Die Design, Part VIII

A description of the design and operation of a progressive die for blanking clock parts.

By C. W. HINMAN
Designing Engineer

THE die shown in Fig. 21 was designed, built, placed in operation and then photographed by the Moore Special Tool Co., and it is with this company's permission that we present the illustration. The reproduced photograph reveals many unusual die design and construction features of which several will be discussed in this article. In addition to the die, samples of the high precision workpieces which are produced by means of the die are also shown in the illustration.

This progressive die is designed to produce several workpieces simultaneously, the largest size workpiece being that of a movement plate for a clock. The material used for the workpieces is 0.040-inch hard rolled brass strip. At the same time that the movement plate is blanked, several smaller pieces are punched from the scrap strip. To those readers who are familiar with diemaking, it is obvious that in order to build a die of this type only the highest type of workmanship will suffice and that the tooling details must be just as accurate as those which are required for dies that are used in the production of watch parts, and perhaps even more accurate, since in this particular die several different

pieces of work are cut at each press stroke, and each piece must be produced to precision dimensions.

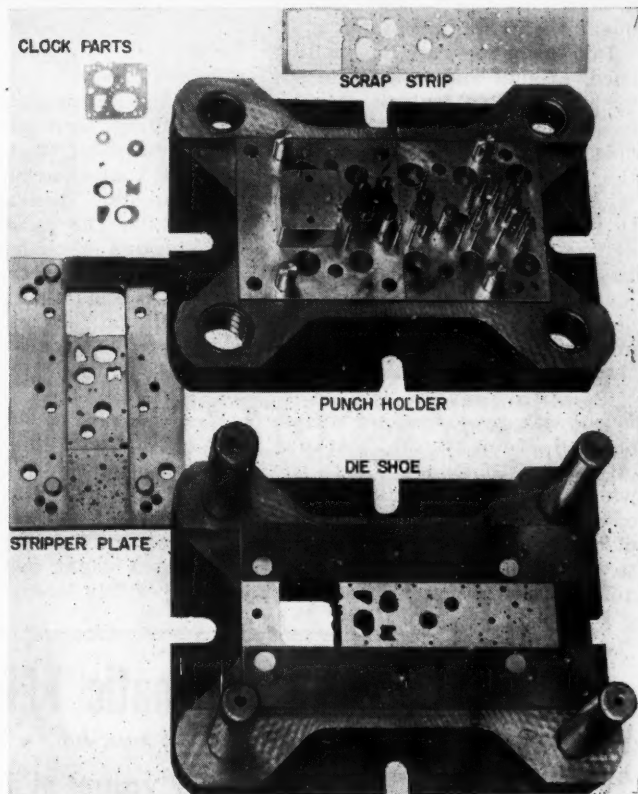
The die blocks for this die are mounted on the die shoe which is shown in the lower view of the illustration. When the die shoe, with the die blocks in their proper positions, is set up in a press in conjunction with the punch holder and punches, the die is ready to pierce and blank the movement plate, two gears, and three smaller parts, at each down stroke of the press slide. The punches are shown assembled in the punch holder. At the left side of the illustration and beneath the workpieces is shown the roof of the stripper plate which has been removed from its place over the dies and turned toward the front in order to expose the details of the die itself and also the complex construction of the stripper plate.

A portion of the scrap strip is shown at the top of the illustration. This scrap strip shows the four stations in which the workpieces are progressively completed. Since the layout of the scrap strip provides the means of producing several parts from portions of the metal that would otherwise be wasted, and the largest blank (clock

Fig. 21 — A four-station progressive die that is designed to produce six different pieces of high-precision work per press stroke.

movement plate) is almost as wide as the strip itself (leaving only $\frac{1}{16}$ inch of metal on each side of the blank), we must conclude that this scrap strip layout is unusual from an economy viewpoint. Punching auxiliary parts from the scrap strip in and around a large blank provides the highest possible economy in pressroom manufacture. Such a procedure not only saves metal, but it also helps to reduce the number of sheet metal gauge sizes which must be carried in stock, and facilitates ordering and stocking of the work parts.

The speed with which the workpieces are produced is unusually high, therefore, each mechanical function of the tool must be maintained in perfect working condition. Four heavy-duty guide posts are employed in order to ensure perfect alignment between the punch and die members. Phosphor bronze guide post bushings are press fitted into the punch holder and during the operation of the die these bushings are provided with a constant supply of lubrication.



Principles in Design and Construction

The die blocks and punch plates are located in slots which have been milled throughout the lengths of the die shoe and punch holder. These slots enable the punches and die to be held in proper alignment, and the shut height of the tool to be decreased. Decreasing the shut height often makes it possible to operate the die in a small press which may provide a higher speed and a greater hourly output. The die is divided into convenient sectional blocks, the purpose being to reduce the possibility of fracturing when hardening to

a minimum and to facilitate subsequent changes and repairs.

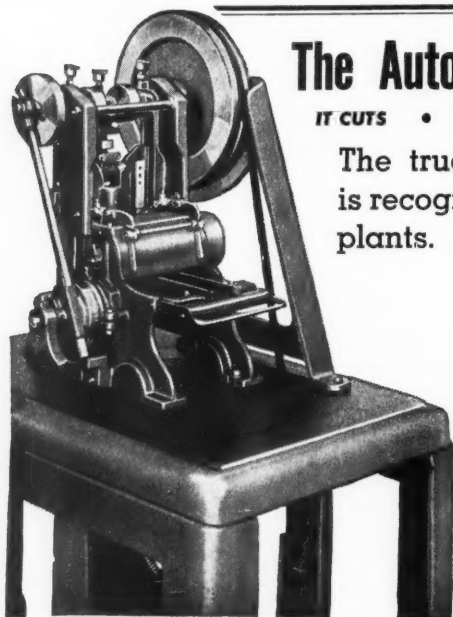
Round die holes are lined with hardened, ground and lapped thin-walled bushings. This feature provides the means for correcting the shapes of holes which may become distorted in the hardening process, and also permits repositioning them by regrounding their interiors on a jig-grinding machine. The use of the bushings also makes it possible to change sizes of holes after the die is built (which is necessary sometimes), by substituting other bushings with the desired diameters of holes.

The channel stripper plate is provided with two separator strips, one on each side of the die, instead of being fabricated from a single plate in which a channel is milled. This type of construction provides a stripper plate of simple design which is easier to correct for wear than if it were milled in a solid plate. The central por-

tion of the stripper plate is composed of four hardened and ground sectional inserts which provide for accuracy and long wear.

The punch plate is divided into two sections, thus making it easier for it to be changed, replaced or repaired. The round punch bodies are larger in diameter than their corresponding points. The punch points are guided through shouldered bushings which are inserted in the stripper plate. This feature stabilizes the punches, makes them "stiffer" in action, and thus ensures the production of accurate work.

Four "bumper-pins" which are inserted in the punch plates govern the shut height of the tool since they make contact with the die blocks at the extreme down stroke of the press. The bumper pins facilitate setting up the tool in a press, and eliminate the waste of several blanks when determining the closed height, and also compensate for a possibly loose and worn bearing in



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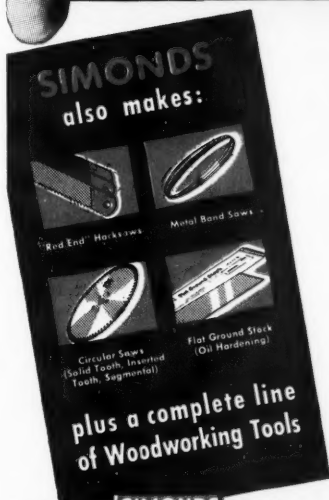
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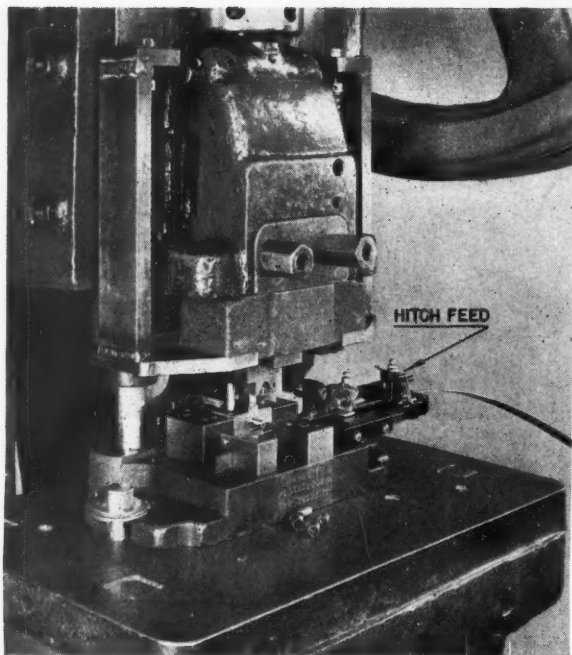


Fig. 22—The Dickerman Automatic "Hitch-Feed," shown herewith, can be attached on either the right or left-hand end of the die shoe.

from the faces of bumper pins in order to maintain the equal shut height relationship.

The interiors of all die openings are accurately ground to size in a Moore Jig Grinding Machine. This grinding operation is important since it ensures accurate sizes in the die openings and therefore accurate work. Holes and openings are ground after hardening in order to assure correct locations. After assembly, the holes and open-

ings are ground throughout the thickness of the die blocks, a procedure which ensures accurate functioning of the die.

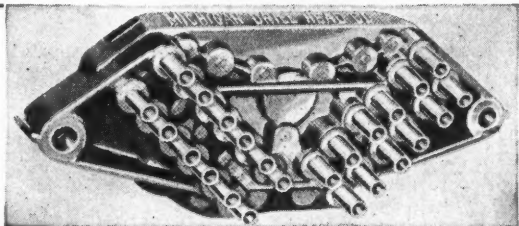
the press slide, or in the crank-arm bearings. Bumper pins also prevent damage to frail punches and dies, to lettering stamps and embossing members, while the tool is in storage; the pins also prevent metal-to-metal contact should the punch holder inadvertently slide down to its shut height. In the grinding of punch and die members a like amount should be ground

A finger stop is provided for halting the forward end of a new strip after it has been inserted into the die. A properly located finger stop prevents "half cuts" and eliminates nicked and sheared cutting edges or broken

Pictured: a 24-Spindle Heavy-Duty Drill Head.

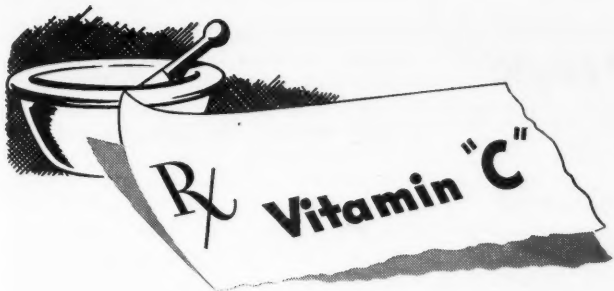
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Why was he able to help them? Here's the reason: Carboloy engineers spend most of their time working with Carboloy Cemented Carbides. They've come up against almost every type of carbide problem you can imagine, in their time. They're experts—specialists in carbides.

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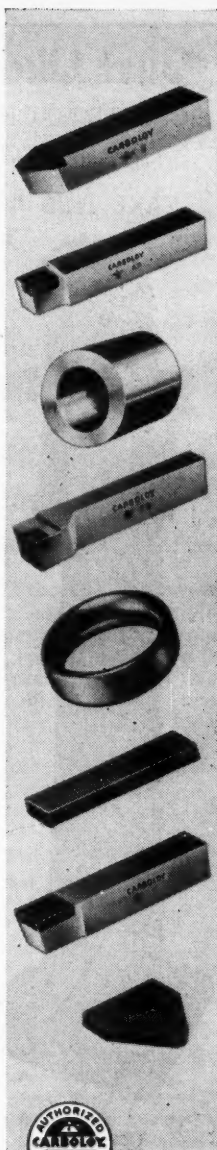
Slight changes in tool design, speeds or feeds, grinding, or tool handling often effect far reaching economies and increases in out-put.

Together, your engineers and our Carboloy specialists can form a team nothing can stop. Together they can use carbides to cure many of your production ills.

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Your Carboloy engineer will be glad to help you with your carbide problems; or in the selection of the most economical tooling from any of Carboloy's 600 standard tools and blanks, or special Carboloy-tipped tools made by more than 150 tool manufacturers.

Why not call your Carboloy engineer? Or write us direct: Carboloy Company, Inc., 11143 E. 8 Mile Blvd., Detroit 32, Michigan.



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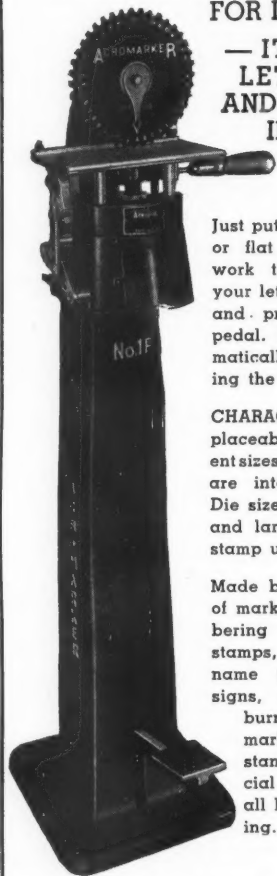
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punches. Positive, "bullet nosed" pilot pins are inserted into several of the punch faces. As the strip is fed through the die from station to station, and the punches descend, the pilot pins engage in corresponding holes which have been cut at previous stations. In this manner, the pilot pins reposition the strip and work before any of the cutting punches actually contact the work strip.

Light spring action push-off-pins may be seen projecting from the faces of several blanking punches. These pins prevent the cut blanks from adhering to the faces of the punches as they ascend. Push-off-pins should project $\frac{1}{4}$ inch or more beyond the punch faces. The action of the push-off-pins tends to force the cut blanks to remain in the dies as they should, and to be pushed through the die openings by succeeding cut blanks under descent of the punches.

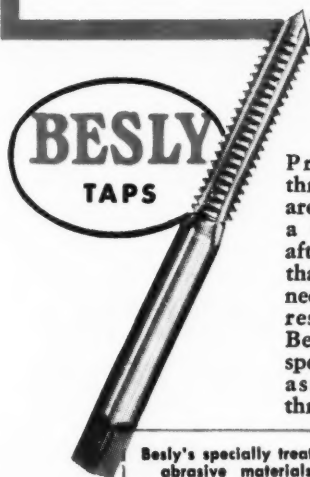
Feeding Progressive Dies

A convenient and unusually efficient piece of equipment is used for feeding light gauge metal strips through progressive dies. This device, known to the trade as the "Dickerman Hitch-Feed," is shown in the illustration Fig. 22. This type of feeding mechanism may be used when the distance between die centers is 4 inches or less. The Dickerman Hitch-Feed is available in two sizes, a small size for strip widths up to $2\frac{1}{2}$ inches and 2 inches throw, and a larger size for strip up to 8 inches wide and a 4-inch throw. For heavier strip and/or longer feeding distances, an automatic roll feed mechanism is recommended.

The body of the feed mechanism may be attached to the right or left end of the die shoe for feeding the die from either direction. Approximately $1\frac{1}{2}$ inch of open space should be provided on the surface of the shoe to which the feeding device may be attached. The feed can also be attached

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BESLY GRINDERS AND ACCESSORIES

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Factory: Beloit, Wisconsin

to a spacer block arranged over the flange of the shoe.

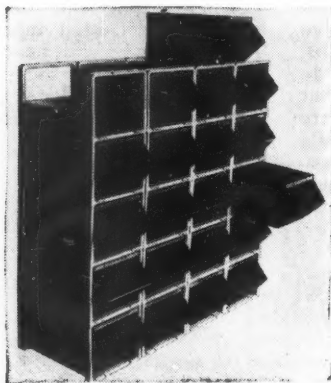
Many hitch-feeds are actuated by means of an angular punch, or lug, which is secured to the punch holder face. When the punch holder descends, the angle on the lug comes in contact with a roller on the feeding slide, which causes it to recede for the next throw. A "pinch-check" lever operates against the surface of the strip and holds it from slipping while a jack-knife grip in front of the check takes hold on the strip. The feeding blades and checks are discernable in Fig. 22. When the ram ascends, a tension spring which is attached to the slide pulls the slide and strip forward a distance equal to the blanking center distance in the die. Feeding distance is governed by the width of the angular punch or lug. To make sure that a sufficient amount of material will be available to the feeding device at all

times, a free loop of strip should be maintained in front of the stock reel.

Feeding distances are very accurate, tolerances of plus or minus 0.0005 inch are common. The width of the operating lug, and the angle on its face are designed to suit the requirements of each individual job, but is a very simple layout that a diemaker can do in a few minutes. Adjustable grooved rollers guide the strip on its edges.

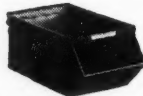
A recent type is the Dickerman 3-inch die feed in which cylindrical rolls are used to advance the strip instead of the pinch-check movement. This feed is designed for handling heavier stock. Either the hitch-feed or the die feed can be mounted to feed strip or sheet from right to left, or vice versa, or from front to back as required.

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Every important dimension in the machine is **GENEROUS**. Bandwheels, 16" diameter, give plenty of grip on the blade and cause mighty little twisting or bending

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Big capacity—10"x18"
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Automatic, hydraulic feed, quick adjustable from front of machine.

Quick-setting vise, operated from front of machine.

Stop for setting work, duplicating length cut-off.

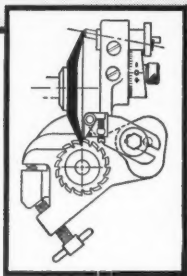
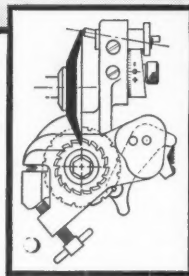
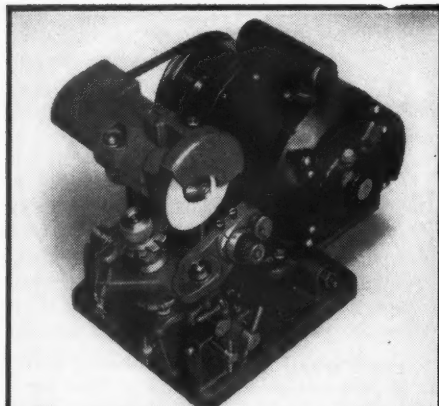
Four motor speeds. Automatic shut-off at end of cut.



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Line drawing at left shows index plate construction; right, pawl locating attachment.

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"Tough nuts" in tight spots
are easily handled with
Snap-on Heavy Duty Wrenches

Reach in, reach over, or under... it's all the same to a mechanic using Snap-on wrenches... built to service "hard-to-reach" bolts and break loose the toughest nuts. Simply by adding a Snap-on Extension and Socket, the mechanic above converts his Heavy Duty Ratchet to the job at hand and completes it with a minimum expenditure of time and effort and a maximum degree of efficiency and safety. Rapid interchange of units, sure grip, tremendous leverage, and high-speed reversible ratchet action that requires only

space for a 20-degree handle movement all explain why this tool is such a favorite with the great majority of top mechanics. Snap-on's Heavy Duty set consists of socket sizes ranging from $\frac{7}{8}$ " to $2\frac{1}{4}$ " together with ratchets, nut spinners, sliding bar handles, universal joints and extensions. Over 4,000 Snap-on tools are available through Snap-on's direct-to-user tool service. There are 40 direct factory branches located in key industrial areas.



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"Selling Tools"

For Machine Tool Salesmen

Excerpts from an address by B. N. Brockman, Vice President and Sales Manager, The R. K. LeBlond Machine Tool Company, at the Machine Tool Sales Refresher Course, Cornell University, Ithaca, New York, July 21, 1948

NOBODY could have listened to the material that has been presented without realizing that better machine tool merchandising must be secured by better planning.

To begin with, we must select the right man to serve our customers. We must train him adequately. We must know where our market is. And we must make sure that when, as a result of all this preparation, we are ready to go after the order, we equip the sales engineer with the necessary tools so that he can do his work effectively, whether he is a direct sales engineer or a distributor's sales engineer.

Certainly the distributor's man must have more of a well-rounded approach to a larger group of problems than the direct seller who only has one line on which to concentrate. In our own case, while we have some ninety-odd machines in the line, we live with them daily, and automatically become accustomed to the possibilities of each machine. The dealer's man, on the other hand, must be versatile enough to switch from one manufacturer to another and to be equally conversant in all the lines he represents.

It is axiomatic that before you can sell MACHINE TOOLS, you need SELLING TOOLS. Without the proper selling equipment, you might as well be on a tour of the territory at company expense. If you do not use the proper approach to interest a pros-

pect, and do not have the equipment with which to sell, you are like the carpenter who would attempt to build a house without tools. We are builders, in a sense, for our companies. We need tools with which to build sales. Before looking at the equipment in the tool box, let's bring the carpenter allegory a little closer to home.

The man who operates an engine lathe with a high degree of skill does not develop this skill by sitting down one night to read an article from some trade magazine. It takes interest, patience, intestinal fortitude, years of learning and teaching. It requires study, handbooks, charts, blueprints. It takes the slide rule, the calipers, and, of course, the machine tool. Those are the tools in learning, developing and perfecting knowledge and success on the job. The man who sells machine tools must likewise have selling tools. Many of these he secures from the shop of experience—by learning—developing—perfecting.

What other tools does a salesman need? Personality and a thorough understanding of his machine are but fundamentals, and hardly enough for the man who sells mechanical equipment. What determines the placing of an order is not what he knows, but how much of what he knows he can instill into the customer's mind. If he is to secure his customer's interest—and hold it—long enough to transmit

what he knows, he must be properly equipped.

He needs samples. He needs models—photographs—the ability to make a simple sketch. He needs catalogs—circulars—booklets. He needs advertising—preprints—direct mail—performance records—testimonial letters—and sometimes slides or movies.

Preparedness counts. A simple fact or figure about the product or its use can often swing the balance of the sale in your favor. Plant interviews pay off in extra sales. No facts—no figures—no sales.

This list isn't all-inclusive. It isn't intended to be. All sales engineers and all companies do not need all of these tools. On the other hand, some need all and use even more. It depends upon the size of the company, what it has to sell, what it can afford to spend and a number of other factors about which you are as well informed as I am.

The fact of the matter is that the sales engineer is one of the most neglected men in the world. Too often he is left to his own devices; too often he has to manufacture his own selling technique. Much of the information which he could use to good advantage, he never receives. Some of the aids he does have, he does not know how to use. By way of helping this unrecognized hero of American Industry, let's put the microscope on some of the most important of these selling tools.

Samples

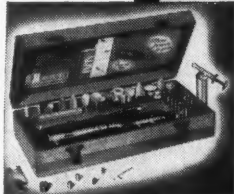
For certain types of machines, for example, an automatic bar machine, samples are very effective. The sales engineer should know who made it, in what factory, of what material, and in what time, as well as how the part is used, what is fussy about it, and so on. Remember, many of your customers absorb information more quickly

Speed—POWER—PRECISION

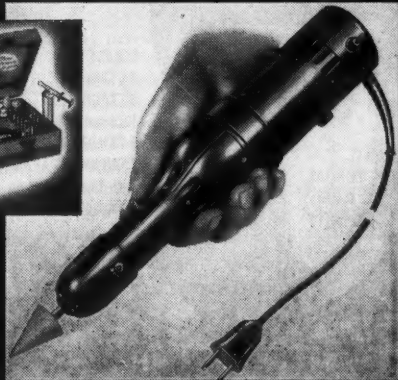
40,000 R.P.M.—1/5 H.P.

Built for production. PRECISE 40, the fastest, most powerful electric handtool made, weighs only 40 oz. Use on any material from file-hard steel to bronze, plastics, wood or rubber. Imagine, with tungsten carbide cutters PRECISE 40 mills the hardest steel!

PRECISE 40 in cool, shock-proof, plastic case operates on AC-DC. Use it as a handtool or as a motorized quill in vise, lathe, mill or on your production set-up. Many accessories and rotary tools available. Also COOL-FLEX Flexible Shaft attachment with 9-oz. air-cooled handpiece.



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and easily through their eyes and fingers than through their ears. If one of them has a similar part to make which is taking him longer, you have started something.

Models

A small-scale model of a machine that can be put on the customer's desk is far better than photographs. It is surprising that this selling tool is so little used. We are all kids at heart; we can't resist a model. Your worst problem will be to get it away from the customer. Such a model may be of painted wood; it need not be operable.

Photographs

Many sales engineers find a photograph album an excellent selling tool. The photographs must be carefully taken to bring out just what he is going to say, and never retouched.

The sales engineer must know the

album by heart; he must never fumble in finding the photograph he wants. The customer is not distracted by any printing; he looks at the photograph while the sales engineer makes his points. It is absolutely essential that, if a question is asked, the sales engineer answer it fully, then go back without confusion to his sales talk, picking up where he stopped. Yet the machine tool purchaser does not like a canned talk or memorized speeches. You must keep in your mind a clear sequence of selling points.

A slide film is a photograph album in a different form. It is better when you must talk to more than one prospect.

Sketches

The simplest selling tool of all is very much neglected — freehand sketches. They may be crude; you're no artist, but when you are making a sketch your prospect's eye will be



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12 GAUGE
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Included as
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Made in sizes up to 60 in. throat, 10 gauge capacity

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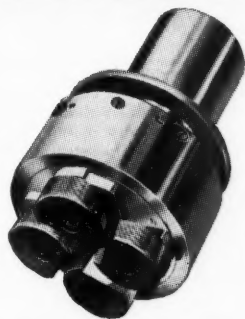
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Here's what NAMCO Vers-O-Tools can do for you ...



● On this job, they're producing a 5 to 8 micro-inch body finish on a $5\frac{1}{4}'' \times \frac{3}{4}''$ bronze valve stem. Three Vers-O-Tools are used; one for hollow milling the 3" shank, with carbide-tipped circular cutters and two with ground thread circular chasers for threading.

The part is machined on a $1\frac{1}{4}''$ Acme-Gridley Bar Automatic with chain-type magazine feed. For the 11 operations the total machining time is 8.5 seconds.

Such speed and precision is typical. Vers-O-Tools and Acme-Gridley Automatics are an ideal combination to give you more good pieces in the pan. May we show you how their inherent adaptability suits them for economical production in your shop?

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics:
1-4-G and 8 Spindle • Hydraulic Thread
Rolling Machines • Automatic Threading Dies
and Taps • The Chronolog • Limit Motor Starter
and Control Station Switches • Solenoids
Centrifuges • Contract Manufacturing

right on that pencil. Learn to draw it his side up. In many cases you can bring out a detail of a tool, of a fixture, or a machine, more effectively than in any other way. Remember that you are talking to a man who uses sketches and drawings all day long in his business.

A photograph may show a lot of things that distract him; a sketch shows only what you are trying to impress upon his mind. What can you remember best, a page of typed matter, fifteen minutes of conversation, a photograph, or a drawing? Think it over.

Catalog

The most useful tool we have in our sales department is the general catalog which outlines practically all of the machines which we build. As a rule, catalogs are the rustiest, the saddest and the most abused medium

of information. All you have to do around our plant is to mention the word catalog and you will bring the house down on your shoulders. At least that was the condition until we revised our own some four years ago.

Catalogs deal with cut-and-dried facts. Due to constant engineering changes, which we must continually make, they are extremely difficult to keep up to date. If the creator of the catalog lacks enthusiasm for the job, nine times out of ten you are in trouble, because the advertiser himself does not appreciate the real function of the catalog. The advertising department's budget is often too low to allow for any decided improvement. Most of you know that it is a very expensive item and the result is that the authors feel a little frustrated about the whole thing. At least this is the impression one gets after appraising the legion of catalogs I have thumbed through in



GET THE WHOLE STORY OF SERVICE WITH A *Punch!*

Allied's 48-page R-B catalog contains complete data and prices on R-B Interchangeable Punches and Dies—recognized and used for accurate, trouble-free punching throughout the metal-working and plastics industries. But that is only part of the R-B story. Also included in this catalog is

full information on Allied's "one stop service" which includes retainers, composite die sections, rubber strippers, guide pins and bushings, and miscellaneous die makers' supplies. A copy is available to you without charge or obligation. Write for it today.



ALLIED PRODUCTS CORPORATION

Department 23

• 4624 Lawton Ave.

• Detroit 8, Mich.

USE IT Right on the job!

NEW!

HAND-I-HACK PORTABLE POWER HACK SAW

**Plug into the nearest
light line and start sawing.**

Hand-I-Hack takes the place of Elbow Grease, the most expensive form of power. Cuts to extreme accuracy. Saws solid material to 3 x 3". Has swivel vise for cutting mitres. Works in any position.

**You take the saw to the work,
not the work to the saw.**

Ideal for skilled mechanics:

Tool Makers
Machinists
Maintenance Men
Electricians

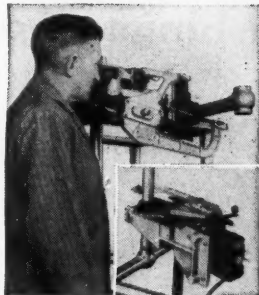
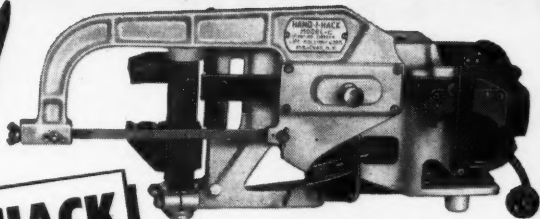
Plumbers
Model Makers
Assemblers
Stock Keepers

In stock at better machinery and supply dealers.
Ask us for name of dealer nearest you.



Cable Address
LIPEGAR

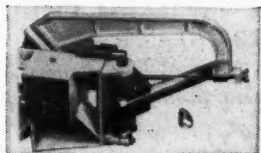
Lipe-ROLLWAY CORPORATION
714 Emerson Ave. Syracuse 1, N. Y., U. S. A.



Works in any position



Cuts squares



Cuts angles

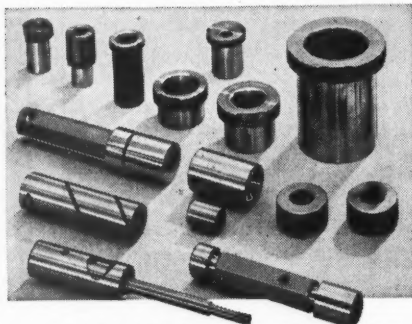
RIGHT ON THE JOB!

RIGHT ON THE JOB!

DRILL JIG



Bushings — Gages



ECONOMICAL—ACCURATE

IN STOCK, ready for immediate delivery, all A. S. A. **STANDARD** types and sizes. Exceptionally fast delivery of **NEW GAGES** and Gages salvaged by **HARD CHROMIUM PLATING**.

*Bulletin and Price Lists
sent promptly upon request.*

Economy

TOOL & MACHINE CO.

1827 S. 68th St., Milwaukee 14, Wis.

the past few years.

If the catalog is not prepared as it should be, if the facts therein are presented with all the effervescence of a glass of flat beer, if sales engineers are not instructed in its use, the company will get only a small percentage of the good out of it that it would have received had the catalog been properly prepared in its creative stages. The common denominator of any catalog can be reduced to this question—"Does it sell?"

We feel that the chief considerations in building up the preparation of the catalog should include the following basic points: Does it induce direct sales? Does it supply the information and technical data that prospects and customers want and need? Is it applicable as a handy sales tool for the salesman? Literature which succeeds in doing these three things, no matter what the size, shape or color, is appreciated by your prospect, the sales engineer and the company whom you are trying to sell.

High among the priorities are illustrations of your products, plus a complete description and information on the use of the product. Feature those parts of your equipment which make for important selling points. While we do not show installations of our equipment on the job in our master catalog, some firms use them to advantage. What we try to feature are the more important selling points, and above all, the dimensions in full detail. Do not be afraid to put **SELL** into the copy, which will otherwise be dull and uninteresting.

Specifications are an important point in selection. People do not page through catalogs out of curiosity. They are looking for something; want to know all about it, including the size, weight, capacity or what have you.

SWEET'S FILE probably know more about the catalog business than



SUPER *Carbide Tipped* **SPECIAL TOOLS**

SUPER *Carbide Tipped*
STANDARD TOOLS

EJECTOR-TYPE TOOLS	BORING TOOLS
DRILLS	MILLING CUTTERS
REAMERS	SHAVING TOOLS
SPOTFACERS	CENTERS
FORM TOOLS	GRINDER RESTS
WEAR PARTS	COUNTERBORES

Get the benefit of Super's many years of experience, solely in the field of Carbide Tipped Tools.

It will pay you dividends.

Special Tools to your specifications — Carbide Tipped — Solid Carbide — all produced by Super skilled engineers and craftsmen.

SUPER TOOL COMPANY

Carbide Tipped Tools

21450 Weaver Road, Detroit 13, Michigan

5210 San Fernando Road, Glendale 3, California

anyone else. From their experience they know that a successful catalog has these important factors so far as overall design is concerned:

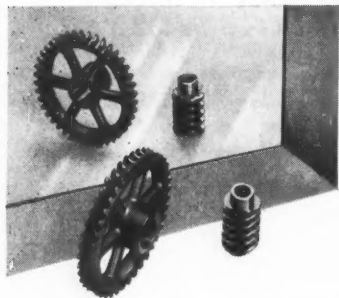
- (1) **IDENTIFICATION:** Does your front cover quickly identify the products and the manufacturer? We do that very well on our catalog by using the phrase "Le-Blond Lathes Turn the World Over."
- (2) **INDEX:** If the catalog covers various products, are they easily found? We have an index, and also have our sizes following in sequence.
- (3) **ORGANIZATION:** Is the catalog divided into sections which are easily identified?
- (4) **VISUAL FLOW:** Is the catalog easy to read? Is it interesting? Are the pictures, charts, diagrams and copy tied up in a pleasing arrangement?

(5) **CONTENT:** Is the information presented and developed in such a manner that prospects can make their own selection with ease?

(6) **ACTION:** Does the catalog impel the reader to select and buy?

I believe this is as good an outline as you will find anywhere. If you follow it in detail, you will develop a catalog that's a tool that you can be proud of, one that can be used with profit, and one that your prospects can read with interest.

Catalogs, like salesmen, need to revise their selling tactics periodically. To put it bluntly, overhaul it for selling effect. It will take more work and effort, but it certainly pays off in the long run. You may think of it this way—the manner in which the catalog is constructed is like a salesman's approach if he were trying to sell without a catalog. Just as the salesman sometimes uses the wrong approach,



• Our Engineering Department will assist you in the design and application of high quality fine pitch gears, worms, etc., without obligation. We invite you to submit your prints for quotation.

Write for latest bulletin describing Beaver Gear Facilities and Methods.

GEAR REFLECTIONS

• Gears are the motivating force in such units as highly sensitive instruments, fishing reels, timers, tuning devices, or gear reducers. The smooth operation and often the success of these units depends on the quality of gears used.

• Quality-made gears reflect the ability and experience of their maker. In turn, they also reflect the reliability of the unit in which they are installed.

MEMBER OF



Beaver Gear Works Inc.

1022 PARMELE STREET

• ROCKFORD, ILLINOIS

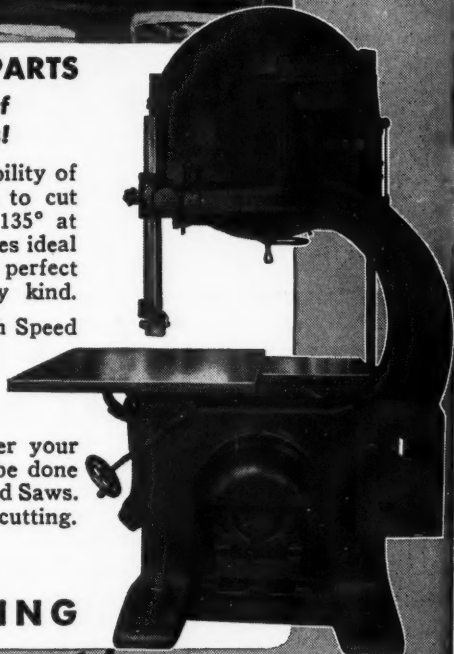
The SUPER METHOD



of TRIMMING FORMED PARTS
and performing a host of
other metal cutting jobs!

The negligible down-drag and the ability of Tannewitz High Speed Band Saws to cut sheet metal from 90° to near 0 or 135° at tremendous speed make these machines ideal for trimming. Cuts can be made with perfect safety without using a rest of any kind.

Friction sawing with Tannewitz High Speed Band Saws also results in perfectly amazing time savings in the cutting of flat sheets, soft or hardened steels, armor plate, plastics, glass and many other materials. Whatever your cutting problem, chances are it can be done better and faster with Tannewitz Band Saws. Investigate this "Super" method of cutting.



**FRICTION
SAWING**

with
Tannewitz

**Write for Your
Free Copy**

HIGH SPEED BAND SAWS

THE TANNEWITZ WORKS **GRAND RAPIDS**
4, MICHIGAN

so do catalogs often get off on the wrong foot.

I said a catalog should look smart. It should also be sharp. It works day in and day out. It is a tool which works even when the salesman is not in the prospect's office to back up its arguments. Many companies are still distributing, direct to the prospect or through their distributors' organizations, catalogs that are seedy in general appearance. Yes—the cover may have changed. There may be a few cuts of new products. The type may have been re-set with a more modern face but its general appearance still lacks the quality which we all strive to build into our products. If the catalog is well disposed to meeting prospects without the help of a salesman, it will surely put him in a better light when he does make the personal contact. Good catalogs can make the sales engineer's time more productive be-

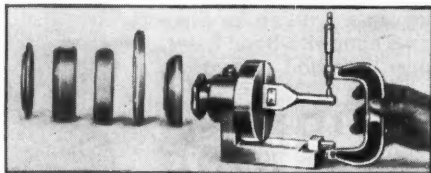
cause prospects, conditioned by catalogs, are closer to decision and do not need the usual warming-up period. One can get down to the actual closing of the business with a minimum of discussion, and concentrate on recommendations, price and specific proposals, if the advertising material in correct form, has paved the way. As your catalog performs, so will your sales engineer.

Circulars

All of you, I know, feel that your circulars are the last word. These "assistants" come in for a great deal of scrutiny, particularly when attached to your proposals, where it is not feasible to send the entire catalog. After the buyer has interviewed all of the competitors, after he has received the various quotations, when generalities are cast aside, and the committee on purchase gets down to picking the suc-

TALLMAN RADIUS EMERY WHEEL DRESSER

Concave radii
dressed up
to 2½"



Convex radii
dressed up
to 1⅜"

To dress a .250" concave radius raise diamond holder .250" above center. Lower diamond holder .250" below center for .250" convex radius. Pass diamond across face of wheel by rotating spindle with hand wheel, running wheel away from spindle.

An inexpensive dresser for precision performance.

Write for folder.

ALSO MANUFACTURERS OF CLAMPING BLOCKS AND DRILLING PLATES.

TALLMAN TOOL & MACHINE CORP., ROCHESTER, N. Y.

PRODUCING END MILLS

— despite this



On June 23 a mid-air collision of two Navy fighter planes over Detroit caused one to crash into the middle of the Putnam plant, killing the pilot, injuring two Putnam workers and causing considerable damage to the grinding department. Miraculously no workers were killed.

Putnam Tool Company is pleased to announce that this accident, one of the most unusual to befall an industrial plant, will not inconvenience Putnam customers. Fortunately, raw stocks and finished products were not seriously damaged. Emergency repairs put the plant back into production within 10 days after the crash.

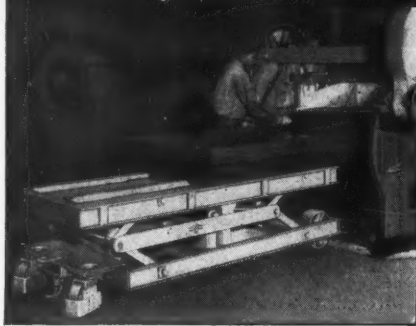
Putnam still offers best delivery from the country's largest and most complete end mill selection!



PUTNAM

2985 CHARLEVOIX AVENUE • DETROIT 7, MICHIGAN

**NOW...
Sheet Feeding is Easy
...and SPEEDY!**



New 10,000 lb. capacity Double Cylinder Type Sheet Feeding Table. 36" x 96" platform. Other capacities available.

LYON-Raymond

Hydraulically-Operated SHEET FEEDING TABLES

Now you can speed up press and shear work . . . keep your machines at maximum capacity. With LYON-Raymond Sheet Feeding Tables, the top sheet or strip stays at press bed level. A pedal-operated hydraulic pump, located near the operator, elevates table. Operator slides sheet or strip into position.

LYON-Raymond Sheet Feeding Tables are portable . . . they can be loaded at stock pile and moved from warehouse to press. Platform remains level with uneven load.

Available in 2000, 4000, 6000, 10,000 and 20,000 lb. capacities. Flat tops for horizontal bed presses—tilting tops for inclined bed presses, with or without table top extensions.

FIND OUT what LYON-Raymond Sheet Feeding Tables will do for you. Write directly to us for Bulletin 260. Tells the whole story. Ask for it today.

**LYON-Raymond
CORPORATION**

724 Madison St. Greene, N. Y.

cessful bidder, the circular is often the deciding factor. It must, therefore, tell him at a glance what he will get when he buys. Will your offering give him the capacity he has in mind? The degree of accuracy he requires?

Our circulars are planned with these requirements in mind. Into each of them we try to pack as much printed salesmanship as possible. We try to point out, for the convenience of the buyer, our every advantage, and we detail these advantages even to the floor space required. This is important to him as well as to our distributor organization.

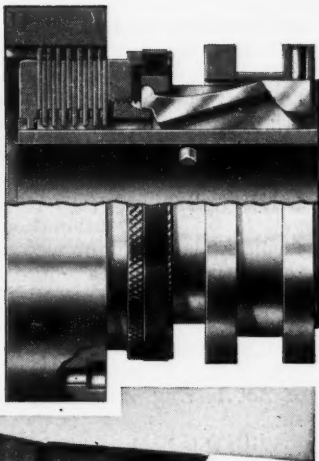
While we expect the sales engineer to be thorough in discussing our products in their entirety, half of the time his calls are devoted to a specific machine inquiry which can be readily and effectively handled by a circular. It is regrettable, but true, that where a multiplicity of lines are handled, the average distributor cannot be as thorough as the direct sales force; by the same token you must condense your information for the distributors' men and do it effectively.

Booklets

Last year we tried something which became one of the most important sales tools we have ever furnished our field men. It was a transvision portrayal of our Dual Drive Lathe. We dubbed it "The Silent Salesman," because we were egotistical enough to believe that with this booklet the machine would sell itself. It is a three-dimensional transparency in five colors and was expensive to produce, but it was selected as the one and only satisfactory method of graphically presenting the revolutionary design and construction of the new dual-driving headstock. The machine itself was a trial balloon; so was the "Silent Salesman." It was regarded as even better—and considerably less expensive—than a demonstration model machine,

MAXITORQ

**KEEPS
GOOD
COMPANY**



Shown above are the Maxitorq Floating Disc Clutch and the modern Steve-Krane Stevadore 5 ton capacity Crane, manufactured by the Silent Hoist & Crane Co., Brooklyn, N. Y.

The Maxitorq is inside the winch and transmits the power for Hoisting and Lowering for the load line.

Here's a further instance of the fast growing adoption of Maxitorq Clutches by nationally known manufacturers.

Other product or machine designers, manu-

facturers of machine tools or machinery may also find that Maxitorq has the "extra" features they need.

For instance . . . compact, streamline design; patented Separator Springs that keep discs apart in neutral . . . no drag, abrasion or heating. No tools needed for assembly, adjustment, take-apart. Shipped completely assembled ready to slip onto a shaft. Capacities to 15 H.P. at 100 r.p.m., wet, dry, single or double.

Want to join our "Good Company" family?

Send for Catalog MM9



THE CARLYLE JOHNSON MACHINE COMPANY
MANCHESTER • CONNECTICUT

and certainly could be given wider distribution. By providing our sales force with this unique booklet, we think we have given them one of the most modern of sales tools.

Engineers who have seen this book, say it is more revealing than motion pictures, photographs, charts, blueprints, or any combination of these media. This technique virtually X-rays the lathe in three dimensions and thereby presents a much sharper conception of lathe design, construction and maintenance, than ever possible before. We did make one mistake; that of not having it printed in a larger size.

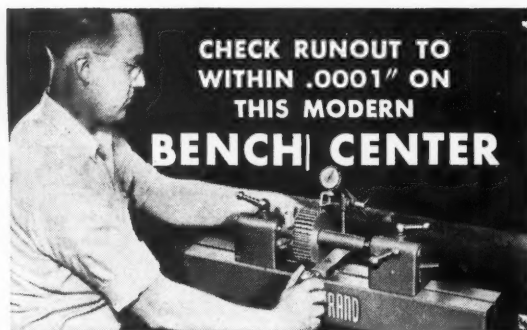
With this book on his desk, it is possible for the lathe buyer to examine the construction details inside and out. He can disassemble and assemble the machine piece by piece as it were, merely by turning the pages.

Like anything else, the novelty wears off, but the "Silent Salesman" still

performs many functions in addition to direct selling and self-selling. It is being used as a textbook in many schools under the title of "Visual Demonstrator." As an interesting sidelight, the U. S. Marine Corps ordered a thousand copies bound in special covers bearing the Marine Corp insignia, solely for educational use. Frankly, we sold a lot of the machines on the basis of this booklet but the cost is too high to allow its use when a number of different designs are involved.

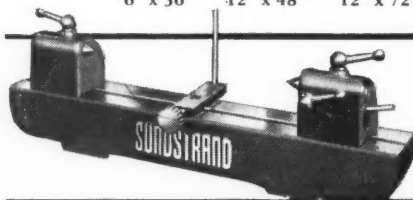
Advertising

One of our sales engineers told me recently that he felt that there was not much difference between manufacturing a product and manufacturing an order. He worked on the theory that it was his job to determine which steps can efficiently and economically be performed by our equipment so as to increase the productivity of the skilled workman. We do this day in



COMPLETE RANGE AS FOLLOWS:—

6" x 18"	12" x 36"	12" x 60"
6" x 36"	12" x 48"	12" x 72"



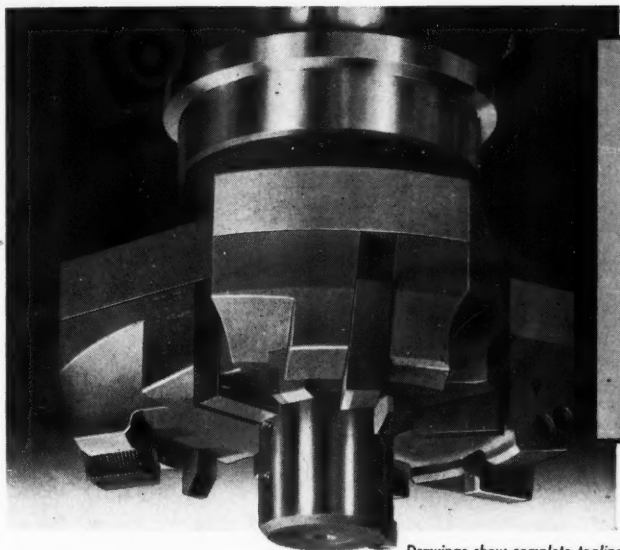
A precision tool for testing and checking parts between centers. Both heads adjustable, locked in place by lever-operated clamps. Work is held between one fixed center while spring loaded retractable center clamps work in position. Dial indicator with adjustable holder available as extra equipment.

FREE ADDITIONAL DATA covering complete specifications and additional features is contained in this bulletin. Write for your copy today. Ask for data sheet No. 576.



SUNDSTRAND MACHINE TOOL COMPANY

2539 Eleventh St. • Rockford, Illinois, U.S.A.



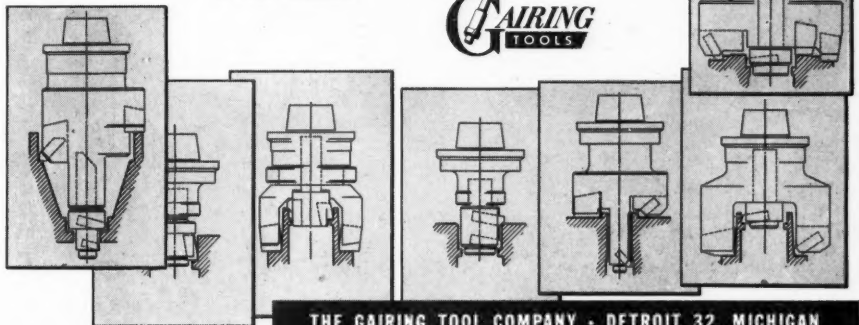
Multiple Tooling

Drawings show complete tooling for a two-way, trunnion-type, four-spindle, roughing and precision boring machine, producing power take-off units. Each tool performs one or more operations such as boring, counterboring, chamfering, facing, and hollow milling.

More precision parts at lower costs are made possible through specially designed inserted blade cutting tools.

This actual example of multiple tooling recently completed by GAIRING suggests how the use of sound and proven principles of cutting tool design might improve the production of *your* machines.

So, if your present production falls short of expectations, let GAIRING's engineers make a comprehensive analysis of your problem.



THE GAIRING TOOL COMPANY • DETROIT 32, MICHIGAN

The ACCENT'S on ACCURACY . . .

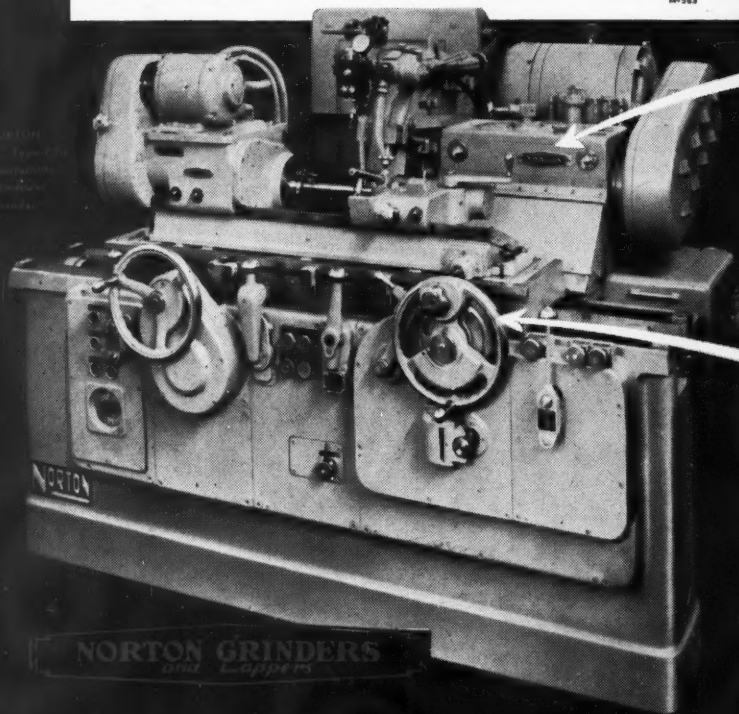
YES—the accent IS on accuracy in NORTON 6" and 10" Type CTU Cylindrical Grinding Machines—an enduring "make-money" accuracy that pays dividends in your grinding department—hour upon hour—day after day.

The basis of this accuracy is shown on the opposite page:

1. A rigid, wear-resistant spindle running in hard bronze, trouble-free sleeve bearings.
2. A responsive, easily operated feed mechanism that stands up under high production wear and tear—yet keeps delivering close limits on size.

The grinding wheel unit plus its method of feed represent the "heart" of a cylindrical grinder. In the new NORTON CTU line you get a NORTON-designed and NORTON-built "heart" that means low-cost grinding for you—low-cost accuracy and low-cost finish.

M-563

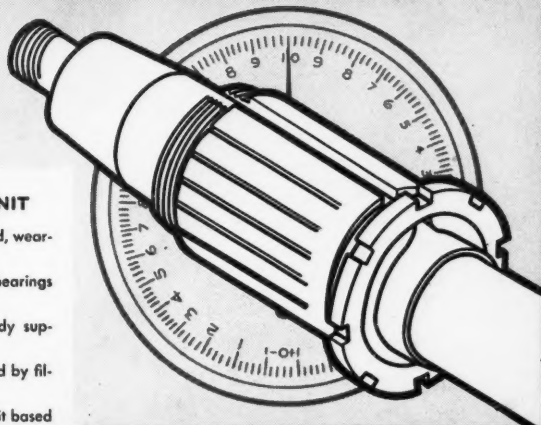


Accessories: Grinding Wheels, Grinding and Lapping Machines, Relocatable, Process Machine, Non-Vibrating, Norton, Precision, Laboratory Machine.

in NORTON Type CTU Grinders

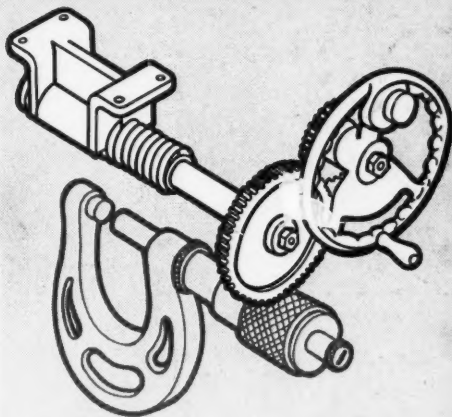
WHEEL SPINDLE UNIT

- Heavy spindle of toughened, wear-resistant alloy steel
- Extra-long, hard bronze bearings—easily adjustable
- Over 50% of spindle body supported in bearings
- Bearings force-feed flooded by filtered lubricant
- Design of wheel spindle unit based on time-tested principles
- Vibration-free performance insures fine finish and enduring accuracy

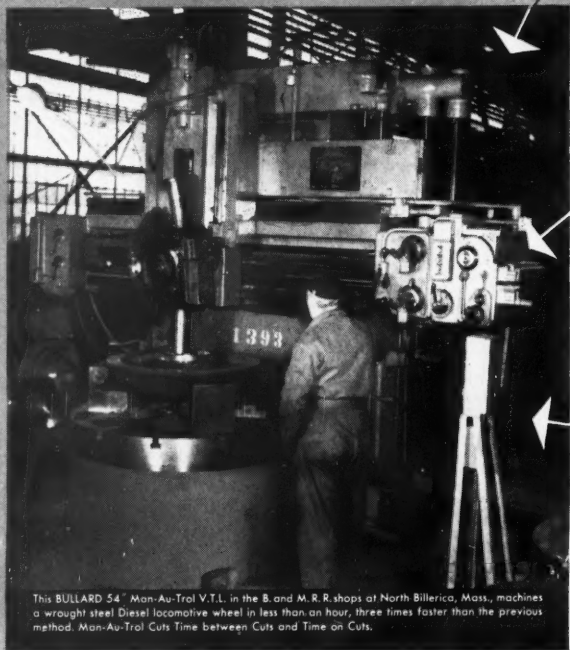


WHEEL FEED MECHANISM

- Wheel feed mechanism combines unique hydraulic and mechanical features for speed and accuracy
- Grinding feed taken by "revolving the feed screw"—micrometer-fine accuracy obtained by solid metal-to-metal contact
- Automatic wheel feed at table reversal—quickly adjustable over wide range
- NORTONIZER Automatic Work Sizing Device available. Gives excellent repetitive accuracy on close limit work—increases production—decreases or eliminates inspection time—reduces rejections.



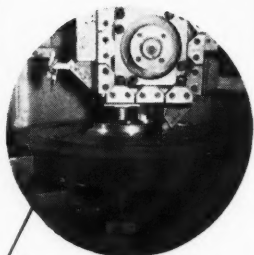
BULLARD MAN-AU-TROL V. T. L. AUTOMATICALLY MACHINES DIESEL WHEELS 3 TIMES FASTER



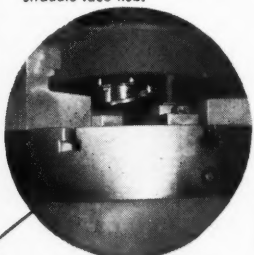
This BULLARD 54" Man-Au-Trol V.T.L. in the B. and M. R. R. shops at North Billerica, Mass., machines a wrought steel Diesel locomotive wheel in less than an hour, three times faster than the previous method. Man-Au-Trol Cuts Time between Cuts and Time on Cuts.

Your investigation of BULLARD Man-Au-Trol for your work will convince you that its combination of versatility, accuracy, productivity, cost-cutting ability is hard to beat. Write for Bulletin MAV-G-1 today. THE BULLARD COMPANY, Bridgeport 2, Conn.

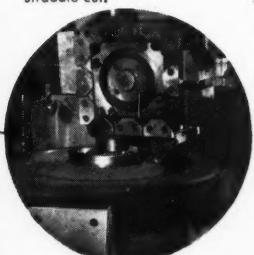
BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE



Boring tool and turning cutter on B. and M.'s Man-Au-Trol V.T.L. have nearly finished cuts. Head then moves to right to straddle face hub.



View from underside showing boring tool at end of cut, ready to move to right to take straddle cut.



Finish of hub straddle facing operation. Now head and bar move to center of bore and rise to index position.



and day out with the result that we come up with a lower unit production cost, increased production, and therefore, greater profits.

Now let's suppose you apply this same approach to an analysis of your selling process. You discover which steps can be most efficiently and economically performed by the high-speed, low-cost tool of advertising. Why? To increase the productivity of the skilled workman in the field—the sales engineer. Advertising performs the preliminary steps in the manufacturing of an order. It permits a sales engineer to concentrate his limited time on the job that he alone can do best; namely, closing the sale. The result—lower unit selling cost—increased sales.

It is generally understood that there are five basic steps in the manufacturing of an order; namely, contact, interest, preference, application, and the order itself. All salesmen take these five steps. A great deal of time, however, is lost on contact, interest and preference, with the result that they have very little time for the specific proposal and the actual order. Here is where advertising steps into the picture as a useful and economical tool. We all spend money for advertising primarily because we realize that advertising will accomplish something more quickly and effectively than could be achieved by any number of salesmen.

Advertising is a tool—a selling tool and a mechanical tool; a high-speed tool and a low-cost tool. Well used, it capably accomplishes the first three of the five steps to the building of the order; that is, contact, interest and preference. If handled properly, it frees the salesman so that he can concentrate on the vitally-important steps; application, and the order itself, which can only be secured by personal contact. Finally, by closing the order.

Advertising is not intended to take



THE ELLIS DIVIDING HEAD

Many unique features make the ELLIS Dividing Head more than an ordinary indexing fixture. It is a precise, rugged unit with $6\frac{1}{2}$ " normal swing increased to 11" swing through the use of riser blocks. It TILTS more than 100 degrees in the vertical plane—SWIVELS 360 degrees in the horizontal plane—INDEXES by crank, or directly by hand. Work is held between centers, or in chucks or collets. The ELLIS Dividing Head is a universal work head that will increase the production versatility of your milling machines, grinders, drill presses and jig borers—write for complete details today.



the place of the sales engineer, nor can the sales engineer take the place of advertising in present-day selling. To me, advertising is a means of making hundreds of calls simultaneously, contacting thousands of prospects, cheaply, quickly, and at regular intervals. It is a known fact that the most successful industrial marketers are those who use both sales engineers and sales promotion in the proper proportion. The proper proportions are dependent upon the product, the methods used by the competitors, the size of the company, and other factors.

These are only a few, but a mighty important few, of the benefits I think can be derived from the fertile field of advertising. Again, it reaches all of the buying influences including those hard to contact, maintains friendly relations between calls, and finally, paves the way for an effective interview.

I need hardly add that advertising is not a useful tool for the sales engi-

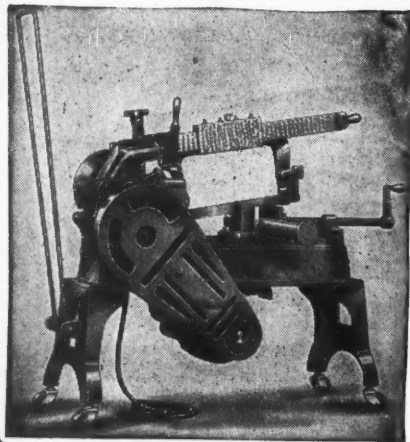
neer unless it is the right kind of advertising. Advertisements should be sales talks in print. If you could talk to the President of the International Harvester Company for five uninterrupted minutes, what would you say about your machine tool? All right—that's your ad. By means of it, you are talking to him and thousands of other top-ranking executives.

Direct Mail

Direct mail selling seems to have quite a field in our industry. The direct mail medium seldom sells on its own strength. Its proper use is not to complete the sale but rather to support the means by which new and repeat business is obtained; that is, personal selling.

Direct mail has many functions and sometimes it can do amazing things, some good and some bad. It has advantages and disadvantages. There are right and wrong ways of handling it.

SAWMASTER HACK SAW



LOW PRICED

PORTABLE
SELF-CONTAINED

READY TO WORK

Angle
Cutting
Vise

STURDY
ECONOMICAL

Write for Bulletin
No. 300

MILLER-KNUTH MFG. CO. OMAHA, NEB.

• OPERATIONS

• APPLICATIONS

• CUTAWAY VIEWS

MILL HEAD CATALOG

Free

NOW READY

See the New Rusnok Rail Type Bracket that permits use of Mill Head in any position around over-arm of your horizontal mill. For vertical and single or compound angular operations. Rusnok Mill Head and Brackets are available for conversion of all popular makes of milling machines.



HEAVY DUTY

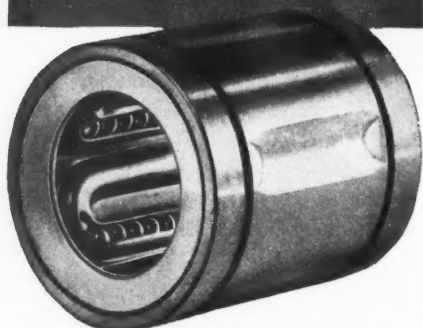
RUSNOK

ATTACHMENT

MILLING • DRILLING • BORING

RUSNOK TOOL WORKS • 4840 W. NORTH AVENUE • CHICAGO 39, ILL.

At last!!
**A BALL BEARING FOR
 YOUR LINEAR MOTIONS**



BALL BUSHINGS

Sliding linear motions are nearly always troublesome. Unlimited travel BALL BUSHINGS can be used to tremendous advantage on guide rods, guide posts, reciprocating shafts and for support of any mechanism that is moved or shifted in a straight line.

**LASTING PRECISION ALIGNMENT
 ELIMINATE BINDING and CHATTER
 ZERO SHAKE or PLAY
 LOW FRICTION and WEAR
 LONG LIFE — LOW MAINTENANCE
 SOLVES SLIDING LUBRICATION PROBLEMS**

Now available for 1/4", 3/8", 1/2" and 1" shaft diameters. Additional sizes to follow.

Write for literature and name of our representative in your city. No obligation, of course.

THOMSON INDUSTRIES, INC.

DEPT. D, MANHASSET, N. Y.

PLANTS: Miscota, Long Island... Lancaster, Pa.

FRICTION COSTS MONEY

ROLL IT

DON'T SLIDE IT

There are also right and wrong times for using it. Some advertisers have little faith in it; others oversell it. In my opinion, there is a place for direct mail in every concern for every product. Resulting failures may be due to timing, the mailing list, and the very mailing piece itself.

What should go into the mailing piece? If it is a catalog, you already have the answer. If it is about a particular machine or other equipment, follow the same procedure. In other words, tell the whole story. Tell all to sell all. Do it directly. Do it handsomely. Do it in an interesting way, and do it briefly. Tell your customers how to act; and tell them to act. A mailing piece that tells a good story and gets the prospect sold, and neglects to encourage him to act, misses the main point.

At no time be afraid to ask for the order. Direct mail advertising is not meant to supplant regular business paper advertising. Some things it can do better than the business paper advertisements; and vice versa. The big advantage of direct mail is that it gets individual attention. It has more news value. It can talk about a subject at length, thus giving time for the prospect to consider. Advertising is a shotgun. Direct mail is a rifle; it can be more accurately aimed.

One disadvantage of direct mail is that some recipients regard it as cheap publicity. Another; that it is impossible to include all of the executives who influence buying. To them, business paper advertising may carry more authority and weight. The direct mail piece is seldom routed to others and it suffers the additional disadvantage that it cannot meet or answer objections which may arise.

Performance Record

Performance records are the very heart of effective selling and advertising. Nothing is so reassuring to a works manager who faces the respon-

TEAMWORK

that licks the toughest sanding jobs
— this SMOOTH COMBINATION

SIOUX RESIN BOND Abrasive Discs

Cut faster with less effort. They're flexible, tough, long lasting, non-loading, give maximum cutting action and remain cool. It's the ideal disc for any and all sanding operations



SIOUX High Speed Sanders

Ball-bearing construction, heat treated alloy steel gears, permanent lubrication. Cyclone fan for increased ventilation and patented tool spindle lock for changing discs. 3 Models: No. 1250—9" High Speed Heavy Duty; No. 1267—7" High Speed Heavy Duty and No. 1265—7" Special.

Sold only through
authorized SIOUX distributors

No. 1267 SIOUX Heavy Duty Sander (illustrated) No load speed 4250 R. P. M. Universal motor operates on A.C. or D.C. Overall length 15"—weight 13½ lbs. A very popular model.

STANDARD THE



WORLD OVER

ALBION & CO., INC.

SIOUX CITY, IOWA, U.S.A.

sibility for spending his company's money for a new machine than the story of how another works manager did the same thing and succeeded in cutting his cost.

Testimonial Letters

Your customer will write a testimonial letter because he wants people to know how progressive he is. You can have it reproduced so that each copy looks like an original letter. These are splendid for direct mail, enclosure with quotations, and sales interviews.

Reprints of effective articles in trade papers should be similarly distributed. Your customer gets a ton of magazines a month; he may have missed your story.

Portfolio

Another use of advertising, in addition to its job in the trade magazines, is that its messages, when used as

preprints, can make up the bulk of the sales news portfolio sent monthly to all sales engineers and all sales organizations.

This portfolio has many uses. It contains a wealth of information and about everything the sales engineer needs to back up his sales talks. It usually contains preprints and reprints, schedules, sales news, sales plans, engineering and technical developments. In short, everything of interest to the men in the field. Everything to help make productive salesmen more productive.

Personally, I prefer preprints of ads over reprints. Reprints are old stuff. Many prospects have already seen them. Preprints, on the other hand, are new; they are stimulators, not only to the sales engineer, but to the prospect as well. They can be used as opening wedges to a discussion. You can send one or two of them to a customer along with a letter. One of our

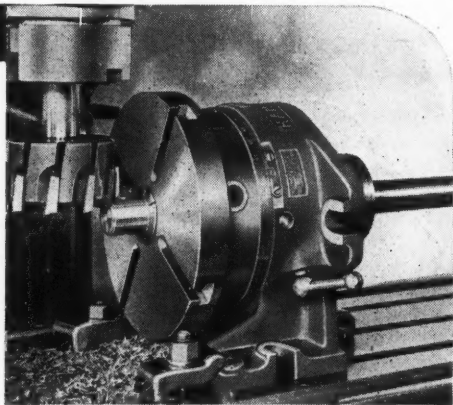
SUPER-SPACER

FOR MILLING

The uses of the Super-Spacer in horizontal and vertical milling operations are unlimited. Here the Super-Spacer, mounted with a face plate and draw-in collet combination, shows its adaptability for milling bar stock. Investigate your present milling methods and see if your shop can't profit by the speed and accuracy of the Super-Spacer. For complete details write Dept. 56.

SPECIAL MACHINERY

HARTFORD SPECIAL is equipped to build from prints almost any type of special machinery, parts or operations. Our facilities give your shop an added capacity. Bulletin E-200 gives complete list of our Machinery Equipment and capabilities. We'd be glad to send you one.



HARTFORD

Special

THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 5, CONN.

THESE MEN WILL TELL YOU IDEAL LIVE CENTERS HELP TO *CUT COSTS!*



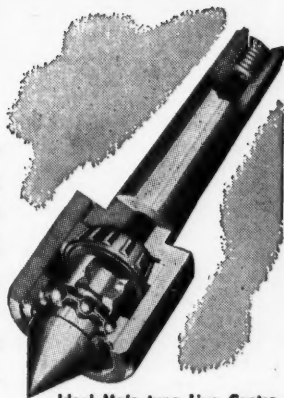
Says Joseph Dietz, general foreman of Republic Flow Meters Co., Chicago: "Ideal Live Centers give us greater turning speed and have helped increase production 15% to 25%. They save both grinding time and lubricating time."



Says Fred Huer, machinist at Republic plant: "Ideal Live Centers improve the quality of the work. They eliminate chatter, center lubrication, and burned out centers."

In scores of plants the story is the same: Ideal Live Centers mean better work—at lower cost. No friction between the center and the work—no burning or gouging—deeper cuts and faster turning speeds. Ask for information and a free demonstration of the Ideal Live Center. Check its quality and unique construction. Look at its record of cost cutting service.

IDEAL INDUSTRIES, Inc.
1031 PARK AVENUE, SYCAMORE, ILLINOIS



Ideal Male type Live Center.
Female and Pipe type Centers
also available from stock.
Also Heavy Duty Live Center
—built to carry heavy loads.
Accurate to .0005.

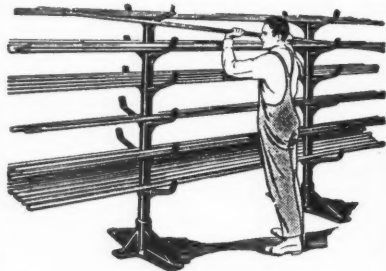
*Distributed
Through*

AMERICA'S LEADING WHOLESALERS

CANADIAN DISTRIBUTOR: IRVING SMITH, LTD., MONTREAL



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard inter-locking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal thruout, depreciation is practically nil. SEND FOR BULLETIN 26-M.

BROWN SECTIONAL RACK

BROWN ENGINEERING CO.

120 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

distributors does this very effectively.

This portfolio, which we call the LeBlond Sales News and Advertising, goes to both domestic and overseas distributors. It effectively replaces the vast volume of the spur-of-the-moment circular letters with which distributor organizations and sales engineers are normally plagued, and it brings news of interest to men in the field in one complete package.

Through the Sales News, distributors are given a preview of advertisements to appear in business papers during the next month. We encourage the distributor to order company-sponsored helps and to suggest further promotion methods. It also keeps them abreast of any news involving our products. Response to the Sales News from the field indicates that it is serving a long-felt need by maintaining regular communication with the company's independent distributor organizations, and it does stimulate enthusiasm for LeBlond's entire line.

Slide Film

Many sales training subjects, topics of statistical or graphic nature can be presented very effectively with slides. As a matter of fact, we recently used the slide system in demonstrating some of our equipment to a large manufacturer in Detroit, and the interest in these pictures was astonishing. In this particular case the equipment had been installed and the purpose was merely to show the operating personnel all of the features and the possible advantages that they could secure by correct operation. At the meeting we reached about thirty-five individuals whom we could never have reached in such a short space of time.

Movies

Another very important selling tool is motion pictures. Movies and talkies continue to have tremendous appeal. No other medium can pack into it the

COSTS SLASHED 40%

17,000 Screwdrivers Finished Daily

This is the case history of a manufacturer who formerly used standard setup wheels for finishing the 17,000 screwdrivers turned out daily in his plant. 3M Engineering Service recommended switching to 3M Abrasive Belts and a special grinding unit. Results were immediate and convincing—a 40% to 45% saving on finishing costs, better finishes and far fewer rejections.

3M ABRASIVE BELTS CAN REDUCE COSTS IN YOUR PLANT

If you're looking for faster cutting and smoother finishes—flat or contour surfaces—3M Abrasive Belts are the answer! Lowered production time, increased output, and fewer rejections are combined with long, economical belt life to produce new savings and a new quality of output.

Further information can be had from your local 3M Distributor. Or you may use the coupon below to request your free copy of our booklet explaining how 3M Abrasive Belts speed up and simplify grinding and finishing.



MMS 948

Please send us a copy of your booklet
"Step Up Production"

By _____

Firm _____

Address _____

City _____ Zone _____ State _____

3M ABRASIVE BELTS



Made in U. S. A. by

MINNESOTA MINING & MFG. Co.

Saint Paul 6, Minn.

drama, the logical thought, or illustrate the features of a product as well. A movie can be your very best sales story and there is always one best way to say a thing, every time you run it off.

From the sales point of view, the movie can be made to speed up the selling process. Through the use of photo-diagrams, animated drawings, and cutaway views which get inside the product, it becomes comparatively easy to point out and explain special features. An explanation which requires a series of photographs in the catalog or other forms of presentation can be covered in a matter of seconds with the movie. It unfolds the story, in whole and in part, dramatically, clearly, and concisely, leaving but few questions to be answered by the sales engineer. What better convincing argument is needed than to show your product in actual use, or to show it

under actual construction? It leaves little room for doubt in your prospects' minds.

This is the age of change; the world we knew before the war is gone. We are now adjusting ourselves to supersonic planes and television. The world is changing so fast that you scarcely have time to digest what is new today before tomorrow is upon you with still further advances in our ways of doing things. But changes symbolize progress and American Industry has always been progressive.

It is quick to anticipate what tomorrow will bring, and it is just as quick to act. These changes require vision and courage. Basically, they require sales promotion. We, as sales promotion men, cannot continue to use the techniques of by-gone years without trying to improve them. To be old-fashioned in business is to be out of business in a very short space of time.



HI-LO



VARIABLE SPEED PULLEYS

• Hi-Lo Variable Speed Pulleys give infinite variable speed on any constant speed motor. Using standard V-belts, they maintain constant speed at any set point, no matter how the load varies and automatically regulate belt tension to the load. This is accomplished by a cam action within the Pulley, eliminating heavy springs and prolonging belt life. Hi-Lo Pulleys can be conveniently installed on machines already in service or incorporated into new ones. Furnished from fractional up to 5 HP, they will give a thousand speeds with any constant speed motor.

EQUIPMENT ENGINEERING CO.

2853 COLUMBUS AVE. SO.

MINNEAPOLIS 7, MINN.

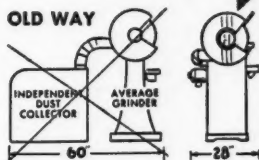
SEND FOR COMPLETE CATALOG



"BUILT-IN" FEATURE

SAVE OVER 50%
FLOOR SPACE THE
HAMMOND WAY

OLD WAY



Hammond

of KALAMAZOO

NO-DUST GRINDER

- Requires only 6½ square feet.
- Protects employees' health.
- Protects nearby machine tools against excessive wear from dust and grit.

A self-contained Grinder and Dust Collector for 10", 12" and 14" wheels. Write for Bulletin No. 104.



Hammond
Machinery Builders
INC.

1615 DOUGLAS AVENUE

KALAMAZOO 54, MICHIGAN



UNIVERSAL DRILL BUSHINGS

Universal Drill Bushings with superhoned bores have been the first choice of industry since the founder of Universal Engineering Co. originated standard drill bushings nearly 30 years ago. Available in standard and special sizes to speed and simplify your jig drilling at greatly reduced tool breakage costs. Complete stock of standard bushings available for immediate shipment. Write today for complete information.

**UNIVERSAL ENGINEERING CO.
FRANKENMUTH 9, MICHIGAN**

We must discard the rusty tools of selling and replace them with the new sharp ones which alone can do the job that lies before us.

We cannot relax and keep up with an America that is on the move. Production is showing the way; it is not enough for us to follow; we must keep pace with it and pass it, if we are to keep rolling. Every marketing technique, every advertising and sales tool we know, must be used wisely, courageously and extensively.

A cardinal principle in successful selling is in a sales engineer's attitude toward his customer. Instead of figuring out how to sell him, the sales engineer should always have in mind why the customer should buy. Supply the right answers to that and the customer will close the sale for you.

Adamas Tungsten Carbide Tool Tips. Price List M-648, written in Spanish, French, and English and published by the Adamas Carbide Corp., 1819 Broadway, New York 23, N. Y., presents dimensions of tungsten carbide tool tips in millimeters and the various standard shapes suitable for use in single point lathe tools, milling cutters, and other cutting tools, as well as wear parts. The various grades of tungsten carbide suitable for cast iron, steel, non-ferrous metals, and other materials are detailed. Copy of Price List M-648 free.

Progressive Standard Rocker Arm Welders. A four-page technical bulletin describing its improved line of air-operated standard 30 and 50 kva rocker arm welders for the high production spot welding of a wide range of light to medium duty work is now available from the Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich. The bulletin includes a complete table of performance data and specifications for each of the eight models under different conditions of operation; diagrams showing the location and operation of various units; and numerous line drawings illustrating the manner in which the welders can be used to weld different types of work. Copy of Bulletin No. 702 free upon request.

NEW PROVISION FOR **PRECISION**

ON MULTIPLE SPINDLE MACHINES

Scully-Jones Micro-Nut
used on Adjustable Adapter
in Multiple Spindle—
Note Mark on Spindle
to Facilitate Accurate
Adjustment.

Graduated to permit Ad-
justment to within .001 in.

Set-Screw Does Not
Touch Threads—Pre-
vents Thread Damage.

SCULLY-JONES

MICRO-NUTS*

You make "Precision" Adjustments—Now you can make really accurate adjustments on Multiple Spindle Machines to .001 in., by scribing a mark at any point on the Spindle (see illustration) and turning the easy-to-read, calibrated Scully-Jones Micro-Nut in the direction required.

You Save Set-Up Time—You simply give a quarter-turn to the set-screw, to lock Scully-Jones Micro-Nuts in place at any location on the thread of the Adapter. Note diagram showing that screw does not touch threads.

Keep Inventory Down—Your requirements will be filled immediately from our stock of the following popular sizes, in "Acme" thread: 3/4", 1" and 1-1/16". A complete stock of all sizes for Adapters with "Acme" and "V" threads will be available Jan. 1, 1949. Write for bulletin giving further details and prices.

*Patent applied for

R-2847-MMS

For Both Types of Threaded Adapters—You can use these low-cost Micro-Nuts on your present Adapters with or without set-screw slots.

Make Same Range of Adjustments—You can make the same range of adjustments, between spindle and work, with Scully-Jones Micro-Nuts as you do with standard solid adapter nuts.

Nothing to Get Out of Order—You will like the simple, trouble-free one-piece design, with vapor blast finish. Scully-Jones Micro-Nuts are machined and hardened to our high quality specifications, to assure you the service demanded by modern, high-speed production.

Scully-Jones
AND COMPANY

1909 S. ROCKWELL ST.
CHICAGO 8, ILLINOIS

YOU GET LOW COST, FAST, ACCURATE PRODUCTION WITH OUR STANDARD AND SPECIAL TOOLS



Barker

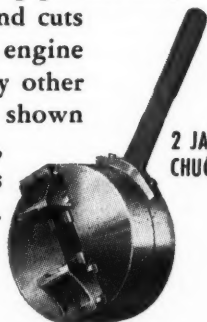
Two-Jaw or Three-Jaw WRENCHLESS CHUCK

will pay for itself in 60 to 90 days on production schedules by giving **MORE** parts per hour at a **LOWER** cost per part. Most round parts can be set in the Barker Wrenchless Chuck without stopping the machine. It saves time, helps speed up production, is simple to operate, reduces operator fatigue and cuts spoilage where the run is continuous on turrets, engine lathes, cutting off machines, drill presses or any other type of chucking machine. The Barker Chuck shown above, replacing an ordinary 3-jaw chuck, jumped production from 18 to 24 pieces per hour. It can do it in *your* plant too. Let us show you how!

3 JAW
CHUCK



2 JAW
CHUCK



Write for bulletin 201 today.

Chuck Division
THOMAS HOIST CO.
28 S. HOYNE CHICAGO 12

IMPROVED EFFICIENCY

WITH

**RUTHMAN
GUSHER
COOLANT PUMPS**



*Photo courtesy
American Broach & Machine Co.*

For improved efficiency in your metal cutting operations specify Ruthman Gusher Coolant Pumps.

Oversized pre-lubricated bearings reduce maintenance cost. Electronically balanced rotating parts assure quiet operation and longer life. Split-second control of coolants, from a trickle to full volume, gives coolant flow where you want it when you want it.

Illustrated is an American VP-5-25-40 Broaching Machine equipped with a Model 11022-C ½ HP Gusher Coolant Pump.

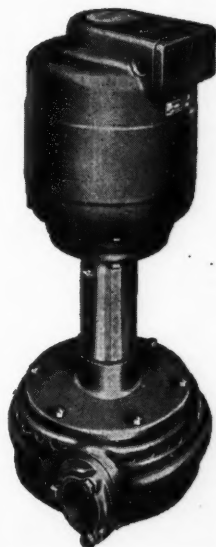
Write now for Catalog 10-F

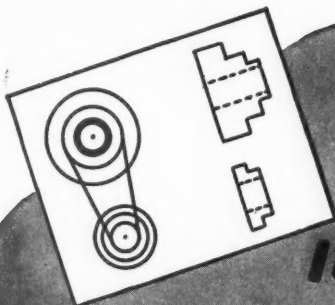
THE RUTHMAN MACHINERY CO.



1817 Reading Road

Cincinnati 2, Ohio





IDEAS FROM READERS

A Universal Type Drilling Jig

By ROBERT MAWSON

MACHINE steel collars of the type shown in the detail drawing Fig. 1 were required to have a hole drilled and tapped at various locations along the length of the collar. The dimension shown as **X** ranged from one to five inches in increments of $\frac{1}{4}$ inch. This tapped hole was to be tapped for only a depth of $\frac{3}{8}$ of an inch.

This machining operation is somewhat simple but if individual drill jigs had been designed and then made for all the various types of collars it would have entailed a rather expensive tool cost. Therefore, to meet this condition

and at the same time reduce the tool cost to a minimum, the universal type of drilling jig shown in the illustration Fig. 2 was designed and made. This jig is made with an angular shaped casting in which is fastened a threaded locating stud **A**. This stud is machined to be a good sliding fit in the $\frac{1}{8}$ -inch reamed hole in the collars.

A machine steel member **B** is fitted with a fixed tool steel bushing in which is placed a slip bushing **F** of the correct size to guide the drill during the drilling operation in the collar. The lower surfaces of the member **B** are machined to be a good sliding fit in machined ways in the jig base.

In the jig base are machined two slots **C** at the lower face of which are machined counter-bored slots. The jig base is provided with slots for bolts which are used to hold the jig securely on the machine table. In a machined recess **D** in the jig base is attached an ordinary narrow machinist scale. On the outer face of the member **B** is fastened an index pointer **E**.

Referring to this pointer it may be seen that the index is located one inch from the center line of the drill guide bushing. The scale is placed, therefore, so that the graduations on the scale are one inch to the left of the center line of the drill guide bushing.

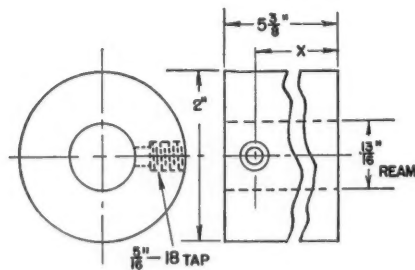


Fig. 1—Drawing of machine steel collar.

NEW



Bellows *"Controlled-Air-Power"* **COLLET CHUCK**

THIS new Bellows air-operated Collet Chuck accommodates collets with a stock clearance up to $1\frac{3}{8}$ ", with a variation in work pieces up to .020", and will permit passing stock up to maximum capacity through the collet. Uses standard collets. Can be mounted in any position.

Gripping power at 60 pounds air pressure equals approximately 185 foot pounds torque. Among many unique features is a "dead man" safety holding stock securely if air pressure is cut off.

Write for Bulletin BZC-50E

The Bellows Co.
AKRON 9, OHIO

932

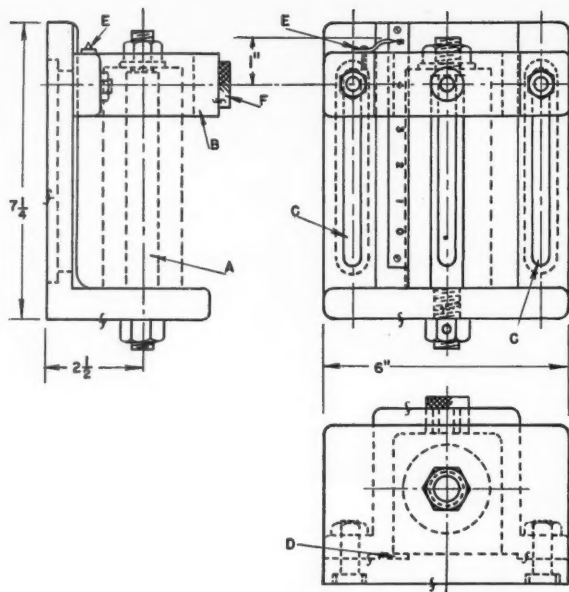


Fig. 2—Drawing of universal type drilling jig which is designed for use in drilling and tapping holes in machine steel collar.

stud and the outside nut tightened to hold the collar in position.

A hole may now be drilled with the tool being guided in the slip bushing in the sliding member in the conventional manner. The slip bushing is removed after drilling and the hole tapped with $\frac{1}{8}$ -18 threads to the depth desired, using a stop collar on the drill press spindle to determine

the proper travel of the tap.

To use the drilling jig, the operator first loosens the two bolts in the member B which may then be moved along the jig base to the position required for drilling the collar. For example, if the collar calls for X to be four inches the member would be moved until the pointer coincides with the 4 inches on the scale.

The two bolts are now tightened in order to hold the sliding member securely in this position. The collar to be machined is then slid onto the locating

The machined collar can then be removed from the drilling jig by removing the nut on the outer end of the locating stud. This universal type of drilling jig is designed to reduce to a minimum the number of tools which would ordinarily be required for this job. The jig is easy to operate and can be quickly changed to suit the requirements of the various types of collars. Another important feature is the low cost of construction.



HINGES

**VARIOUS WIDTHS
and GAUGES**



**BUTTS AND
CONTINUOUS LENGTHS**

WRITE FOR PRICES

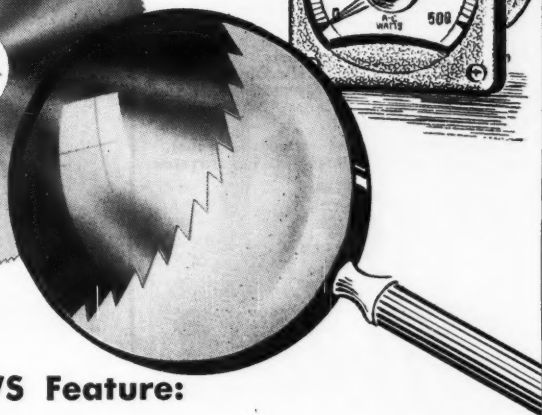
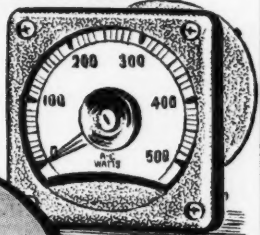
For
**GUARDS
CABINETS
CASES
BOXES**

S & S MACHINE WORKS

4533 W. LAKE STREET HARDWARE DIVISION CHICAGO, 24, ILLINOIS

CIRCLE [®] SAWS

The Finest Teeth
For The Finest Precision Instruments!



Fine Tooth

CIRCLE [®] SAWS Feature:

30 teeth per inch

1" to 6" diameters

Thickness .006 in standard sizes; furnished in .003 up to 1½" diameter as specials.

Throughout American Industry these CIRCLE [®] SAWS have provided for years the delicate precision necessary for producing fine measuring, indicating and control instruments.

CIRCLE [®] SAWS

The "Standard" of Saw Quality

CIRCULAR TOOL CO., INC.

PROVIDENCE 5, R. I.

Chicago • Philadelphia • New York • Dayton • Cleveland
Los Angeles • Rochester • Indianapolis • Detroit
St. Louis • Minneapolis

INDUSTRIAL DIAMONDS DIAMOND TOOLS

DIAMOND WHEELS DIAMOND POWDER



Our No. 703X—Three layers containing a total of 20 diamonds. Multiplicity of cutting points; depending on diameter of wheel, four or more diamonds will always contact the wheel, giving finer dressing and precision finish. Recommended in all straight-faced dressing and truing on wide-faced, hard silicon carbide wheels. Used most effectively on Norton Cylindrical, Landis Cylindrical, Cincinnati Cylindrical Grinder and (with special Adapter) on Cincinnati Centerless Grinder.

Requires fewer passes across the wheel. Generally used with fast dressing traverse.



Molina
INDUSTRIAL DIAMOND CO. INC.

31 W. 47th St., New York 19, N. Y.

Representatives:

Buffalo — Schoenborn Abrasive Sales Co., Box 41

Chicago — J. R. Mendelssohn, 4744 Woodlawn Ave.

Cleveland — John P. Roberts, 501 Perry Payne Bldg.

South Bend — Formrite Tool Co., 1311 W. Indiana Ave.

Toledo — W. C. Sorgen Co., Box 207, Sta. B.

Moline — L. R. Christiansen Co., 309 1/2 16th Street.

Milwaukee — Redi Products Co., 211 South 2nd St.



"There is no economic substitute for diamonds."

A Simple Method of Constructing Stationary Spacers

By D. E. McDONALD

IN the manufacture of stationary spacers of the type illustrated in Fig. 1, unless the shop is equipped to produce these by means of broaching, or by using a vertical shaper in conjunction with a circular table, the cost

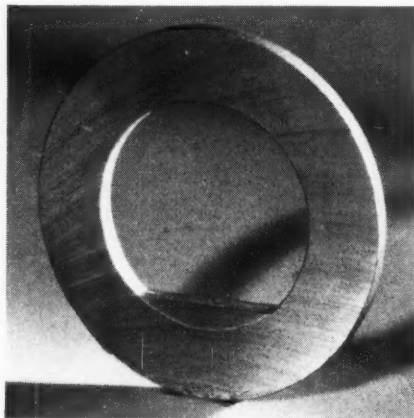


Fig. 1—Illustration of finished stationary spacer.

may become prohibitive. I have devised a means for economically manufacturing these spacers. Where spacers of this type are only occasionally used in the manufacture of different products, I am sure this method will prove interesting to others engaged in the metal processing field. The first operation consists of turning and facing the spacers as shown at A in Fig. 2. You will note that the inside diameter is machined to the actual size paying no attention to the key in any respect.

The next step in producing the spacer as shown at B in Fig. 2 is to turn a disc 0.010 inch smaller than the I.D. of A. This disc is shown at C.

SANFORD

SURFACE GRINDERS

Model MG

Handles many odd size tool room and production jobs, due to its capacity of 8" x 12" x 12". Actual movements — Transverse 8¾" — Longitudinal 13" — Vertical 12" (under 7" wheel).

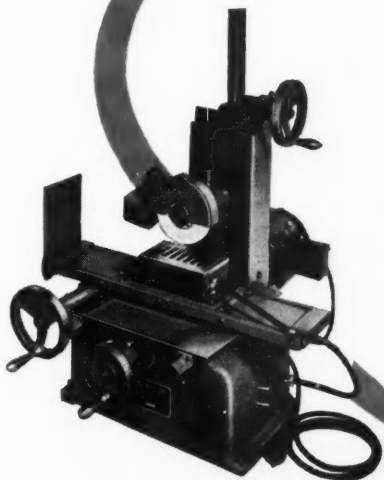


BENCH SURFACE GRINDER

Model SG

A sensitive, highly accurate machine specially designed "for the job that fits in your palm."

Actual movements — Transverse 4" — Longitudinal 8" — Vertical 4" (under 4" wheel).



WRITE FOR COMPLETE DETAILS

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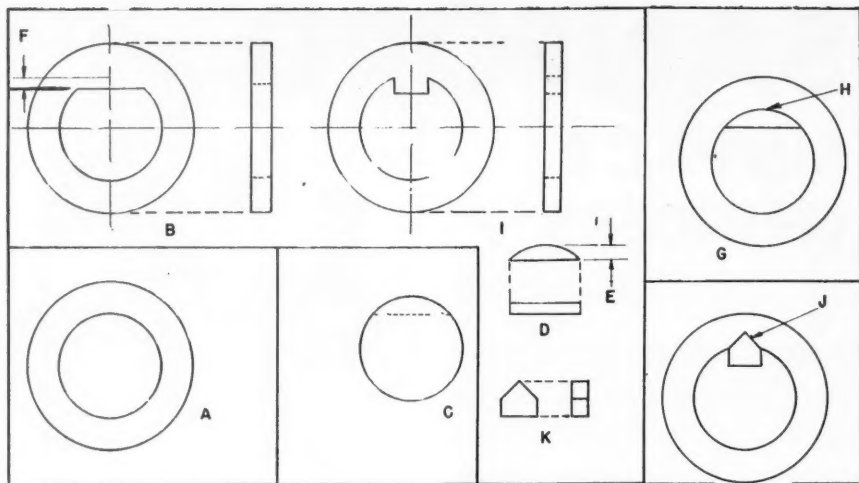


Fig. 2—Drawings which illustrate fabrication operations involved in manufacture of stationary spacers.

After this disc has been turned, a sector is cut off as shown at D. The height of the sector E must equal the height of the sector as shown at F.

The two units are now ready for assembly as shown at G. At this point the inside surface of the washer and the outside surface of the sector is cleaned free from all foreign matter, and both surfaces are coated with a brazing flux. A piece of 0.005-inch silver solder is next placed between these two prepared surfaces as shown at H. The two units are then held together until a positive bond has been effected.

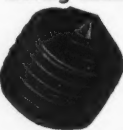
This brazing can be accomplished in several ways, but the writer has successfully used the induction brazing many times.

In the manufacture of the spacer as shown at I, the washer is made exactly the same as described before, with the exception that the inside periphery has a 45-deg. notch put in it as shown at J. This notch should be equal in width to the key and can be put in with a three-cornered file. After this notch has been filed a key as shown at K is made and inserted into this notch and brazed in the same manner



A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{1}{8}$ " to 1" diameters. Send for price list.

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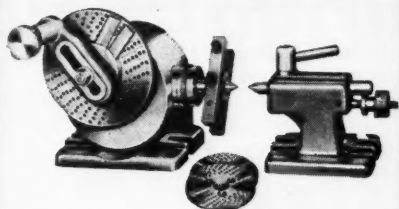
L-W

HIGH QUALITY UNIVERSAL DIVIDING HEADS

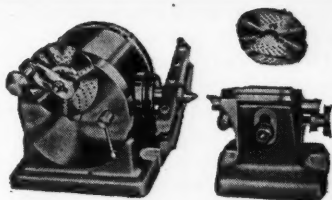
*Made by
America's Largest
Builders of
Dividing Heads*

**ACCURATE
AND
LOW PRICED
TOO!**

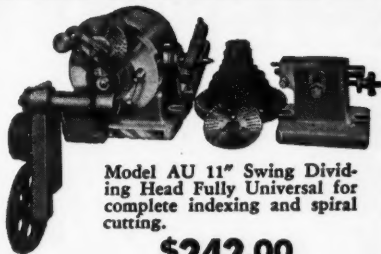
Well built for hard daily usage. Rugged head and tailstock. Alloy steel spindle has a tapered bearing. Head tilts to 90° in vertical position. Special alloy steel worm and bronze worm wheel cut to close limits for accuracy. Complete with three index plates for dividing all numbers to 50 and even numbers to 100, with the exception of 96T. Index chart shows all divisions obtainable to 380.



Model SD 6 1/2" Swing Universal Dividing Head for **\$105.50**
Smaller Milling Machines.



Model BP 11" Swing Universal Dividing Head for plain **\$168.00**
milling machines.



Model AU 11" Swing Dividing Head Fully Universal for complete indexing and spiral cutting.

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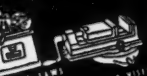
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UNIVERSAL CHUCK



POWER RATE SAW



MILLING MACHINE VICE

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as previously described.

After the brazing operation the washers may be surface ground on both sides to produce a good clean finish, and it may be well to mention that an abundance of coolant should be used during the grinding process in order to minimize heat.

Simple Machinery Transporter

By CLIFFORD T. BOWER

TO move heavy machinery around a small plant in the absence of an overhead crane or other lifting and hauling facilities proved time wasting, dangerous and exhausting until we built the gadgets illustrated in the accompanying drawings. They have since been in continuous use for moving all kinds of heavy machine tools when the occasion demands.

Four units of the same design as that shown in the upper portion of Fig. 1 are required. The body consists of a piece of 4 x 2 heavy section channel **A** to which ball bearing swiveling casters **B** are welded to each end. These casters are equipped with rubber tires and are a stock purchasable article. At **C** is a standard scissors type automobile jack from which the steel base-plate has been removed. Welded to the top plate of the jack is a cross piece **D** with two lengths of one-inch pipe **E** fitted into a second pair of 1½-inch pipes which are welded to the sides of the channel. A second cross piece **G** is welded to the bottom ends of the one-inch pipes.

This arrangement of pipes acts as a vertical slide thus relieving the jack of all sideways strain and directing its function to that of lifting only. The bottom face **H** of the jack is not secured to the channel in any way, so that it may slide thereon and main-

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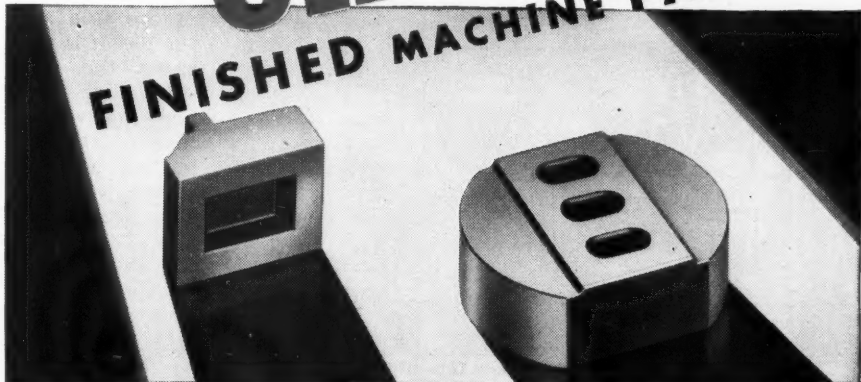
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OILITE

FINISHED MACHINE PARTS



Finished to Precision Tolerances—No Machining

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Parts impossible to machine economically can often be made readily, by OILITE powder metallurgy. OILITE Machine Parts are applicable to mass production.

Note the depression and elliptical bores in the parts shown above.

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Division of Chrysler Corporation



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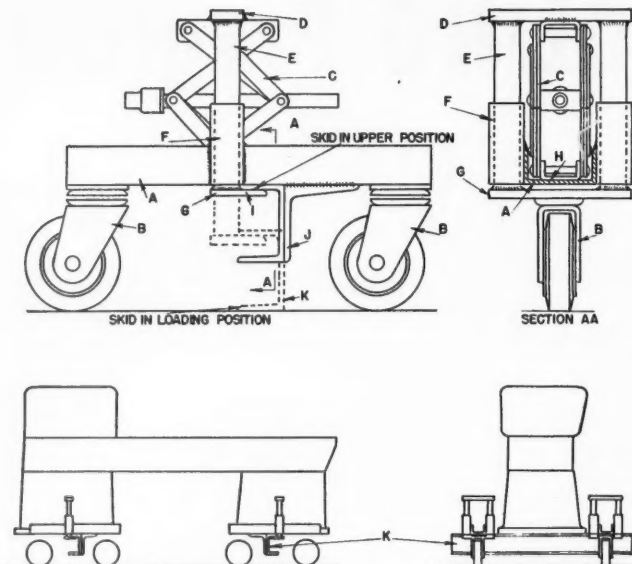


Fig. 1—Simple Machinery Transporter

in order to insert the skid. The caster units are then slipped on to the protruding ends of the skid with the lug or ledge I under the short side of the skid and the vertical face of the skid butting against the angle piece J. The jacks can now be screwed up, thus raising the skid and the load until the top

face of the skid butts against the under side of channel A. It will be apparent from Fig. 1 that the skid and caster units will be rigidly held together as complete units.

The lower portion of Fig. 1 shows a schematic arrangement of a machine ready for transportation with the skids and caster units in place. Machines weighing 4 tons located on this simple machinery transporter can easily be pushed around by two men on a smooth concrete floor. It has been found that if machines are left stand-

tain its own alignment.

The width of the lower cross piece G is extended to one side forming a ledge I while a piece of 4-inch angle J is welded to the under side of the channel.

To prepare a machine or load for moving, it is necessary that a pair of 4-inch skids consisting of channel be inserted between the load and the floor at strategic points. These skids are shown at K. In practice, it has proved fairly simple to raise the machine the necessary 4 inches by means of levers

TO INCREASE PRODUCTION AND TO IMPROVE EFFICIENCY USE BUTTERFLY FILING AND DIE MAKING MACHINES

This is a powerful machine for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14 "EL" and Model "D." The larger the Model, the bigger the stroke and therefore more filing is performed. Furnished with or without pedestals. Constructed as per specification of U. S. Naval Aircraft Factories.

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A difficult production problem of forming two bends in a long length of tubing was solved by "teaming up" two DI-ACRO Benders as illustrated. This dual-forming arrangement saved installation of special machinery. Two accurately formed bends are obtained in one operation—without distortion of the tube and at a cost competitive to power operated equipment. More than 300 pieces are completed per hour—600 individual bends.

"DIE-LESS DUPLICATING" Often Does it Quicker WITHOUT DIES

This is but one example of how DI-ACRO precision machines—Benders, Brakes, Shears, Notchers, Rod Parters, Punches—can accurately and economically duplicate a great variety of parts, pieces and shapes, without die expense. Write for catalog—"DIE-LESS DUPLICATING."

◀ DI-ACRO is pronounced "DIE-ACK-RO".



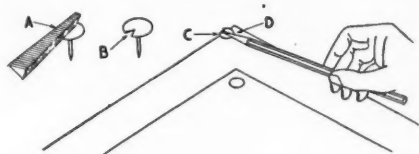
O'NEIL-IRWIN MFG. CO.



306 EIGHTH AVE., LAKE CITY, MINNESOTA

ing on the skids the caster units can be used on other jobs. It is now standard practice to place skids under machines at the earliest possible time and allow them to stay there until the machine finally leaves the plant. The caster units can be quickly attached and the machine moved to a new location in a few minutes with a minimum expenditure of labor and greatly increased convenience.

file a notch in one side of the head as shown at A. After a few strokes of the file the edges of the notch will become sharp as shown at B.



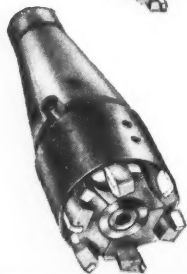
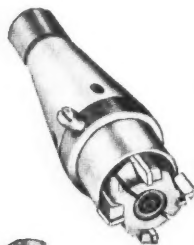
Handy Thumb Tack Pencil Pointer

By A. H. WAYCHOFF

THE accompanying drawing illustrates a good, dependable pencil pointer which may be made for use on a drawing board. Take a large-headed thumb tack and by holding a three-corner file almost flat across one edge

Handy Thumb Tack Pencil Pointer

This tack may then be pushed into the upper right-hand corner of the drawing board with the notch projecting outward as shown at C. A pencil may be held as shown at D and the lead drawn through the notch in order to quickly obtain a needle point even on the hardest lead.

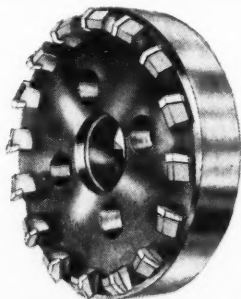


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LOW BLADE COST • GREATEST FLEXIBILITY

HOWALD MILLING CUTTERS are specifically designed to afford the greatest advantages of carbide milling . . . These **PRACTICAL** Cutters include the invention of locking devices using square blades without serrations, grooves or any limiting elements. Blades are removed, replaced and adjusted within a few thousandths in a minimum of time.

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DESIRABLE TERRITORIES AVAILABLE



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TOOLS OF 1001 USES GRIND, DRILL, POLISH,
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For Work on Metals, Alloys, Wood, Plastics, Stone, Horn,
Bone, etc. Plug in any AC or DC socket.

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A good production tool. Has everything—speed, power, versatility and pencil-point precision. Constantly cooled by forced air, the 44 runs cool and smooth all day long. Weighs 2 lbs. 8½" long. 20,000 r.p.m. \$31.50. In wood case with accessories \$42.50.

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A big fellow. Fast, powerful, sturdy, for continuous work. Has ample power to drive a 2½" diam. wheel. Weighs 3 lbs. 10" long. 17,000 r.p.m. In case with accessories \$42.50.

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First tool of this type—today's finest. For precision work. Also gets into hard-to-reach places to make machinery repairs. Weighs 12 oz. 6½" long. 25,000 r.p.m. With 7 accessories \$20.50. Handee with 40 accessories in case \$27.50.

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Grinding and mounted wheels, sanders, steel cutters, etc.—the most complete line to fit any powerful tool — over 500 of finest quality — all made in our own plant.

HANDEE TOOLS and ACCESSORIES are in stock in principal industrial areas.

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- ☐ Hi-Power
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- ☐ Send C.O.D.
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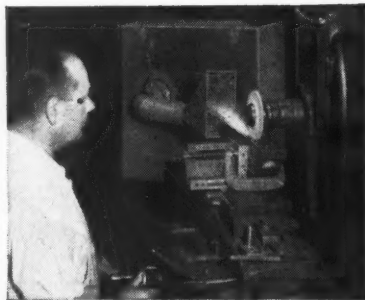
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MODEL 420 ILLUSTRATED

■ Keep machines and workers free of costly, abrasive dusts. Stop worker's complaints. The portable, self-contained DUSTKOP can be placed beside any machine and relocated later. Can usually be in operation 20 minutes after uncrating. Easily connected with metal hose or pipe. With a cyclone separator and spun glass filter, a direct-driven, self-clearing fan, DUSTKOP has the high suction capacity to give you **TOP PERFORMANCE**.

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207 Main at Washington
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Special Lubricated Lathe Center

By A. L. CHAMPIGNY

A SPECIAL lubricated lathe center devised at a General Electric plant prevents shaft centers from "picking up" when machining heavy shafts. It permits the shaft to be lubricated while a cut is being taken, and makes it easy to keep the lubricant free from foreign matter.

Lubricant is introduced into the hole in the center of the shaft by a pressure gun through a fitting on the shank of the lathe center. When the shaft center is full, extrusion takes place along a $\frac{1}{8} \times \frac{1}{8}$ -inch groove on the outside of the lathe center.

As the shaft turns, the lubricant is wiped against the shaft center. The groove is positioned where there is low pressure between the machine center and the shaft center. Thus the best possible adhesion of the lubricant to the shaft center is obtained.

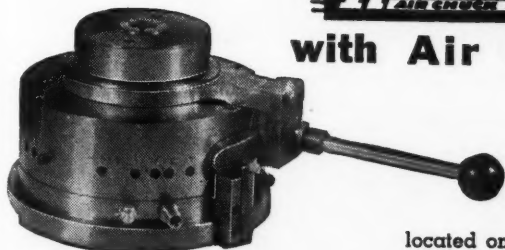
Warner & Swasey Machine Tools. The entire line of Warner & Swasey machine tools is described and illustrated in a 32-page file-size catalog issued by The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. The catalog includes tabulated specifications and illustrations of ram, saddle, and electrocycle turret lathes, single and multiple spindle automatics, precision threading and tapping machines, and general scroll chucks. Indexed for rapid reference, the catalog is available free upon request.

Colonial Straightening Presses. A bulletin describing its expanded line of hydraulic presses for straightening both rough and finished work is now available from the Colonial Broach Co., P. O. Box 37, Harper Station, Detroit 13, Mich. Covered in the bulletin is Colonial's recently announced Model RS-75-12 straightening press with a 75-ton capacity and a 12-inch stroke for accommodating the largest work usually requiring straightening operations. Copy of Bulletin No. PS-48 free upon request.

"Air Devices by Redmer"



Index Chuck with Air Operated Collet



RC-5

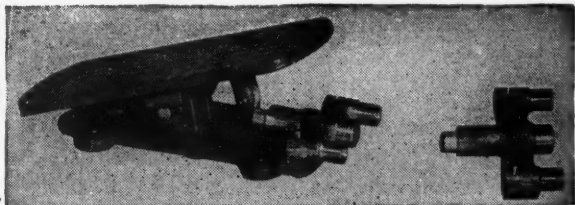
Eliminates removing chuck from base of machine for changing index position. Index screw posts

located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



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Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



No. FC-28

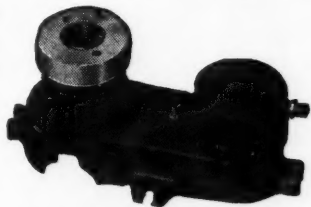
V-29



Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/2". AVAILABLE WITH AIR EJECTION OR OIL FLUSHING.

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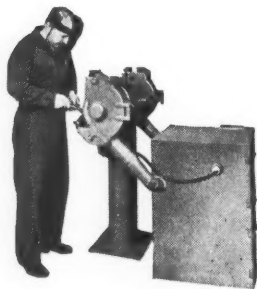
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are doing a *neat job* on these surface grinders

Here is a neat, attractive and efficient dust collecting installation. The TORIT No. 81 Dust Collector does not interfere with the accessibility of either machine. A minimum of piping connects it directly to the grinding hoods. This is the type of set up that pays dividends in good working conditions and high quality output.



Compact, self-contained TORIT Dust Collectors range in size from $\frac{1}{3}$ to 5 HP. They are easy to fit into your production layout, and models for all standard dust collecting jobs are available for immediate delivery. For details and the latest TORIT catalog, write:

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Desmond Hex Dressers

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Desmond makes the only *complete* line of grinding wheel dressers on the market. To you, this means the right tool for every job . . . and, in turn, better performance and longer life from your grinding wheels. Write for the catalog of our complete line and the name of your nearest Desmond distributor.

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News of the Industry

ASTE Semi-Annual Convention

"Progress on the Pacific" will be the theme of the Semi-Annual Convention of the American Society of Tool Engineers, according to an announcement by Harry E. Conrad, Executive Secretary. The meeting will be held October 11, 12, 13 in Los Angeles with headquarters in the Biltmore hotel.

More than 1,000 tool engineers from all parts of the United States and Canada are expected to gather in Los Angeles to study the newest developments in tools and machines and how they are being utilized in the expanding West Coast industrial picture.

Technical sessions are scheduled for the evenings of October 11 and 12, to be followed on October 13 by the National Banquet. In the first session Hall Hibbard, Vice President and Chief Engineer, of the Lockheed Aircraft Corporation, will present "Adventures in Space," a discussion of aircraft development and jet propulsion.

Subject of the October 12 session will be "Petroleum Industry—Tooling, Refining". The six leaders in the industry who will speak and their topics are Gordon Jackson, Vice President and General Manager, Eastman Oil Well Survey Company, Denver—"Whipstocking"; William G. Owsley, Chief Technical Advisor, Halliburton Oil Well Cementing Company, Duncan, Okla.—"Oil Well Cementing"; H. N. Marsh, Production Engineer, General Petroleum Corporation, Los Angeles—"Oil Field Standardization"; A. C. Rubel, Vice President, Union Oil Company of California, Los Angeles—"Exploration"; D. S. Faulkner, Vice President, National Supply Company, Torrance, Calif.—"Technical Aspects of Drilling"; O. N. Miller, Standard Oil Company of California, San Francisco—"Refining".

Tours of leading industrial plants in the Los Angeles area make up the daytime Convention program. All day tours have been scheduled with an eye to combining business with pleasure. On October 11, ASTE members will see the new Ford plant and will visit the Los Angeles harbor. An all-day tour of Kaiser Steel Cor-

poration will include a scenic trip through the countryside on October 12. For the final day, a motion picture studio tour and a visit to the beach area are on the program.

Additional tours, scheduled from 1 to 5 p.m. daily, are as follows:

October 11—U. S. Steel Products Company, American Can Company.

October 12—Firestone Tire & Rubber Company, U. S. Electrical Motors, Inc.

October 13—Aluminum Company of America, Owen-Illinois Glass Company

A special program has been set up for wives of Convention registrants. Personally conducted tours arranged by the Los Angeles Chapter will take them to historic and scenic spots in and around the city.

Kearney & Trecker Purchases Walker-Turner Company

The Kearney & Trecker Corp., Milwaukee, Wis., builder of machine tools for milling and boring, has purchased the Walker-Turner Co., Plainfield, N. J., according to an announcement made by Francis J. Trecker, president. The eastern company manufactures a line of light machine tools for industrial and home workshop uses.

The Walker-Turner plant, which will continue its operations as the Walker-Turner Division of Kearney & Trecker, occupies 180,000 square feet and employs approximately 400 persons. All facilities will remain in Plainfield and general supervision will continue under the present management. Established in 1922 by Ernest T. Walker and William B. Turner, the company confined its efforts during the first 10 to 15 years principally to the manufacture of light woodworking tools intended for home workshop use. Since 1937 emphasis has been entirely upon light machine tools of a high quality and precision for wood and metal for industrial applications.

Earlier this year the Kearney & Trecker Corporation celebrated its 50th anni-

REJUVENATE YOUR BROACHES

TO ORIGINAL CONDITION
(Quick Delivery)

If you have only "round"
broaches (cylindrical,
spline, etc.) up to
36 in. long
72 in. long
84 in. long

You need this
Sharpener

RG1-36
RG1-72
RG1-84

If you have only "flat"
broaches (surface
broaching)

FS3-36

If you have both flat and
round broaches up to
72 in. long
84 in. long

CS3-72
CS3-84

Ask for complete information by model number

with one of these Broach Sharpeners



versary. Organized as a partnership in 1898 between Edward J. Kearney and Theodore Trecker, the company employs approximately 1,700 persons.

Landis Tool Honors Veteran Employees

The Landis Tool Co., Waynesboro, Pa., manufacturer of precision cylindrical grinding machines exclusively, recently presented service award pins to all of its veteran employees. Gold pins set with precious stones were awarded on the night of June 15, 1948 to 201 men and women employees who have had 20 years or more of continuous employment service. This represents 5,396 years of service to the Landis Tool Company.

A. G. Byrant, president, and Tell Berna, general manager of the National Machine Tool Builders Association, were the principal speakers of the evening. M. A. Hollengreen, president of Landis Tool, made the awards at a banquet tendered the veteran employees in Waynesboro. Local industrial leaders as well as officers and directors of the company were in attendance.

Two-Day Course on Spring Design and Specification

Design engineers who have occasion to specify springs are invited to attend a two-day refresher course on "Spring Design and Specification" to be held during alternate weeks at the plant of the Hunter Spring Company (formerly Hunter Pressed Steel Co.) Lansdale, Pa., according to an announcement by Knowlton D. Montgomery, president.

The course will include demonstrations of tolerance computation, open forums and discussions, plant visitation, and six lectures on; basic spring design, the checking of spring specifications, controlling the test load, spring materials and stresses do's and don'ts in tolerance specification and inspection and testing methods.

Engineering executives who feel that their designers should attend, or who are asked by designers to make arrangements, should apply to Hunter Spring Company by letter so that dates can be set with an eye both to mutual convenience and the organization of compatible groups. Tuesdays and Wednesdays have been selected, and the course will be repeated on alternate weeks.

The only expenses involved will be liv-



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25 SHAPES H.S.

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from more than 20 SHAPES with several sizes of each shape.

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Practical for use on small grinders for finishing Patterns, Dies, Parts, etc., in places difficult to reach with the larger Mills

GROUND FROM THE SOLID



SET OF 10

LAB MILLS High Speed

3/16" SHANK 1 1/4" LONG



GROUND—from—the—Solid

These speedy Mills for Dental Laboratories find many uses in Jewelry and in Die and Mold making. Available in 7 popular shapes of 4 or more sizes, each for the finest cutting and finishing. May be reground up to 8 times per 1/32" reduction in diameter.

ACTUAL SIZE

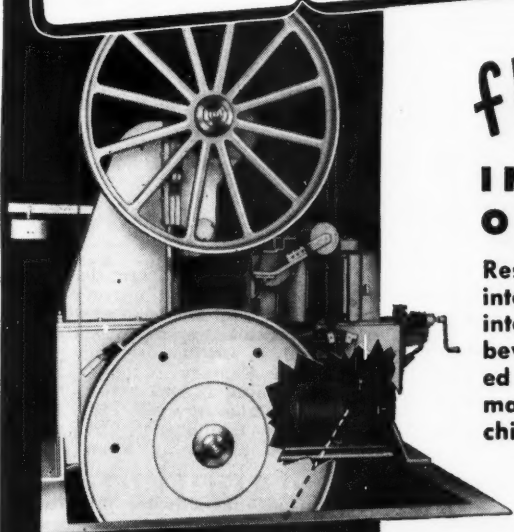
COMPLETE REGROUNDING SERVICE • BY NEW TOOL CRAFTSMEN • SAVES YOU MONEY

SEVERANCE TOOL INDUSTRIES INC.

724 Iowa Street

Saginaw, Mich.

*saxton
resaws* + *LIMA
gearshift
drives* = *40 to 300
f.p.m.
resawed
lumber*



flexibility IN RESAWING OPERATIONS

Resawing 2" or heavier boards into 1" boards—Ripping 2x8's into 2x4's or manufacturing beveled siding is accomplished with the Saxton Resaw, manufactured by Saxton Machinery Co., Albuquerque, N.M.



Single phase units built in $\frac{1}{2}$ and $\frac{3}{4}$ hp sizes. Polyphase in sizes from $\frac{1}{2}$ to 20 hp.

The flexibility of producing from 40 to 300 f.p.m. of re-sawed lumber is obtained by using a 4 speed LIMA Gearshift Drive. This is built into the Saxton Resaw as an integral part of Original Equipment. LIMA can solve your drive problems — write for Bulletin.

THE LIMA ELECTRIC MOTOR CO.

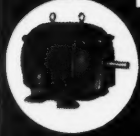
184 FINDLAY ROAD

LIMA, OHIO

REPRESENTATION IN MOST PRINCIPAL CITIES

LIMA GEARSHIFT DRIVES

LIMA PEDESTAL GRINDERS — LIMA ELECTRIC MOTORS



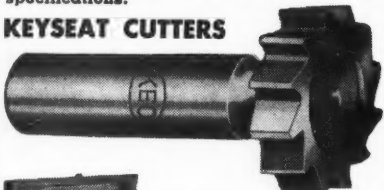


CENTER DRILLS



Made of finest high speed steel. Available in all standard sizes. Always in stock for immediate delivery. Specials made to your specifications.

KEYSEAT CUTTERS



High speed. Right hand. $\frac{1}{8}$ " shank. Diameters from $\frac{1}{8}$ " to $1\frac{1}{2}$ ". Standard sizes in stock for immediate delivery. Complete set—41 sizes—available in sturdy, hardwood box. Saves time and money, because you always have the size you need.

CENTER REAMERS



High speed steel. Reamers from $\frac{1}{8}$ " to $1\frac{1}{2}$ " regularly furnished with 60°, 82° or 90° included angle. Specials made to your specifications.

LATHE MANDRELS



Precision made of tool steel, hardened and accurately ground. Tapered .0005" to the inch. Mandrels from $3/16$ " to $1\frac{1}{2}$ " are .0005" undersize at small end, from $1\frac{1}{16}$ " to 3 ", .001" undersize. Immediate delivery.

Write for Literature

Illustrated literature and prices on all KEO Products mailed on request.

KEO CUTTERS

19326 Woodward - Detroit 3 Mich.

ing expenses and travel to and from Lansdale, Pennsylvania.

The instruction staff will include: P. C. Clarke, assistant general manager; O. G. Meyers, chief engineer, Spring Division; C. H. Sacks, cost controller; F. C. Schulze, chief inspector; F. A. Votta, Jr., engineer; Apparatus Division; R. P. Coleman, Jr., technical editor; and G. A. Williams, designer.

Special quarters in the new Hunter plant in Lansdale have just been provided both for the refresher course on Spring Design and Specification and the already operating Training Course for Inspectors. Hunter considers both courses as its contribution to the "upgrading of skill and understanding in the application of precision springs to precision products."

Did You Know? ---

The Wendt-Sonis Co., Hannibal, Mo., manufacturer of carbide cutting tools, has set up a new warehouse at 1361 W. Lake St., Chicago, Ill., under the management of J. J. Gardenhire. In cooperation with the Eastern Carbide Corporation, warehousing facilities for Wendt-Sonis tools are also now available at 909 Main St., New Rochelle, N. Y., where Walter Ruppel and Tony Allen are in charge.

The International Powder Metallurgy Company has been recently formed in Ridgway, Pennsylvania, for the production of powdered metal products. The following officers have been elected M. T. Victor, president; G. J. Hoehn, vice president in charge of production; and E. C. Berger, secretary-treasurer.

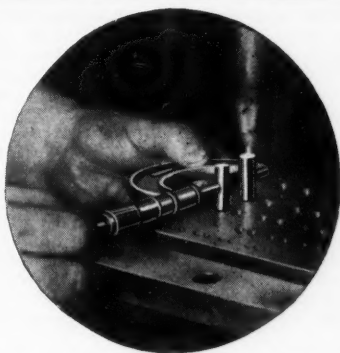
The Washington Steel Corporation has announced the following appointments: John C. Richards as general manager of sales, Robert O. Fulton as assistant sales manager, and S. M. McGough as sales representative. All of the appointees are maintaining their headquarters at the home office in Washington, Pennsylvania.

As part of a general expansion program, the Lovejoy Tool Company, Inc., has purchased a new three-story fireproof building with 33,000 square feet of floor space adjacent to the company's former plant on Main Street, Springfield, Vermont, to allow for maximum production of inserted-tooth type milling cutters through the use of additional modern machines and methods.

YOUR FIRST and WISEST CHOICE

Eliminate fumbling and guessing
when gaging Holes, Slots, Finding
Centers, Locations; Etc.

Horberg Drill Size Pin Gages are
accurate to $\pm .0001$ — .0000.



FOR



DEPENDABLE GAGING

• Overall Length $1\frac{1}{2}$ " • Lower Half
Concentric Tapered for Easy Insertion
and Alignment for Holes down to .0012
smaller • Oil Hardened Tool Steel.
No other pin gage has such accuracy
at so low a cost.

INDIVIDUAL STOCK SIZES \$1.00 each

LETTER SETS: 52 gages
from A to Z—\$45

FRACTION SETS: 60
gages $\frac{3}{64}$ " to $\frac{1}{2}$ " in steps
of $\frac{1}{64}$ "—\$50

NUMBER SETS: 120
gages 1 to 60—\$90

Sets come in pairs for gaging any number of similar holes. All sets
include stands of 3 plates and cover, so that gages stand upright.
Drill size is plainly stamped in front of each hole, together with
decimal equivalent to the ten-thousandth of an inch.



Prices F.O.B. Bridgeport, Conn. Immediate Delivery.

THE *Horberg* GAGE COMPANY

19 STAPLES STREET, BRIDGEPORT 1, CONN.

Did You Know? ---

Having acquired the remaining space in the building which it occupies at 266 Fremont St., the San Francisco branch of **The Foxboro Co.**, Foxboro, Mass., maker of industrial instruments for the measurement and control of process variables, is now settled in its rearranged quarters, with practically double the working space previously available.

Marquette Machinery Co., Detroit, Mich., has announced its removal from the Guardian Building to a new home at 3800 Maple Ave., Dearborn, Mich., where both offices and warehouse are located. The company stocks a large assortment of late type used production machine tools.

The Universal-Cyclops Steel Corp., Bridgeville, Pa., has announced the following setups in its sales force: **V. L. Goulet**, sales representative, Western Illinois and Iowa area; **William N. Smith**, sales representative, Northern Indiana and Metropolitan Chicago area; **Robert A. Bilaitis**, sales representative, Detroit, Western Michigan, and Central Michigan area; and **H. Corwin Miller**, sales representative, Worcester area.

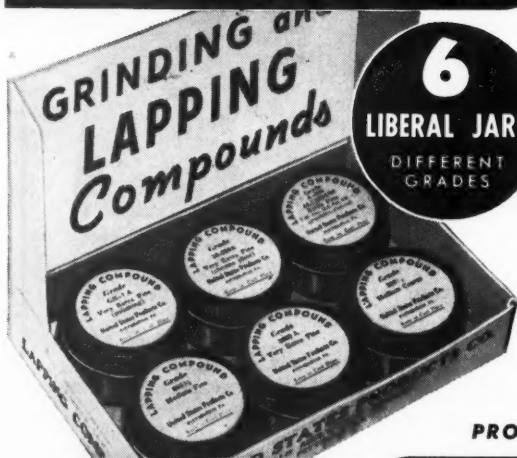
E. F. Houghton & Company of Canada, Limited, manufacturer of industrial oils, chemicals, and leathers, recently began operations on its new Toronto plant under the direction of **E. H. MacInnis**, vice president and director of sales.

Earl Elwyn Smith, P. O. Box 53, West Hartford 7, Conn., has been appointed exclusive representative in the State of Connecticut for the line of precision Swiss machinery and tools distributed by the **Hauser Machine Tool Corp.**, Manhasset, New York.

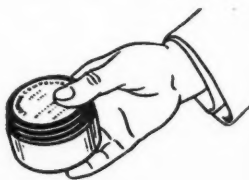
Paul Queneau, formerly superintendent of research at the company's mines and plants at Copper Cliff, Ontario, has been named metallurgical engineer of The International Nickel Company of Canada, Limited, and subsidiaries, according to an announcement by **Robert C. Stanley**, chairman and president of the company. Mr. Queneau's headquarters will be at New York.

Norton Co., Worcester, Mass., has appointed **George C. Gibbons** as resident manager of the company's bauxite plant in Bauxite, Arkansas. Mr. Gibbons succeeds **C. Lawton Rucker**, who is retiring after 32 years of service with Norton.

FREE TRIAL OFFER
NO STRINGS ATTACHED



6
LIBERAL JARS
DIFFERENT
GRADES



A VALUABLE KIT

Kit contains 6 grades of ultra-fine quality, assorted fine grit abrasive compounds suitable for a variety of work. Coarser grit compound available.

FOR PRECISION LAPPING

Here's a get-acquainted offer you cannot afford to miss. Among these samples will be found the answer to many a tool room lapping problem. Hard and soft abrasives for all kinds of lapping needs. Sent post paid anywhere in the U.S.A. and Canada. No obligation—write today.

PROVE THEM AT OUR EXPENSE!

OFFER LIMITED

Write today

UNITED STATES PRODUCTS CO.

520 MELWOOD ST.



PITTSBURGH, PA.



**There IS a
Difference In Gages!**



***Exclusive* WITH REPUBLIC!**

REPUBLIC GAGE COMPANY'S adjustable ring gages are scientifically drawn at the spring holes by electricity . . . The use of this exclusive patented process eliminates distortion and strain caused by the usual method of drawing. Out of roundness is minimized due to the small area of pivotal adjustment. Republic's products with "THAT UNSEEN EXTRA QUALITY" cost no more.

RELY ON



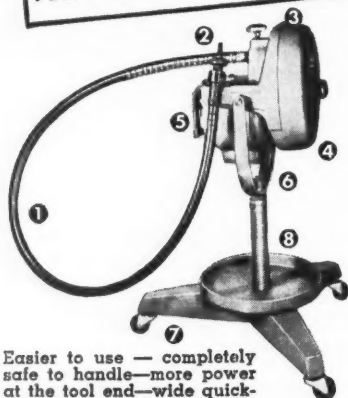
REPUBLIC

REPUBLIC GAGE

DETROIT 21, MICHIGAN

**Faster, More Efficient
Power-Tool Work —
with New**

STOW Streamlined
FLEXIBLE SHAFT MACHINES



Easier to use — completely safe to handle—more power at the tool end—wide quick-change speed selection! No wonder STOW popularity is reaching a new high!

Available in high pedestal mounting as pictured, and also low pedestal, suspension, and bench mountings, the STOW STREAMLINED Machines offer a selection of types to cover great range of applications.

Only the NEW STOW STREAMLINER has all these:

1. Genuine STOW Flexible Shaft, 6 ft. long. Tough heat-treated core, $\frac{3}{8}$ " diameter. Durable, oil-resistant casing.
2. Ball-bearing handpiece, with detachable wheel arbor.
3. Quick change in speed ratio: selection of four shaft speeds.
4. Streamlined, guarded drive for protection to user and machine—better appearance.
5. Ball-bearing motor.
6. Free-swinging pivot mounting.
7. Ball-bearing casters for easy moving.
8. Handy tool tray.

Check on this smooth-working, smooth-looking STOW at your supply house—or write for full description.

STOW

MANUFACTURING CO.

1 Shear St., Binghamton, N. Y.

Did You Know?---

To better serve its customers, the Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill., manufacturer of air cylinders, work feeders, and other air-operated devices, has appointed the **R. M. Wright Co.**, 7401 DuBois St., Detroit, to represent Mead in the entire State of Michigan except the lower tier of counties. Eastern Pennsylvania, the lower half of New Jersey, and the States of Delaware and Maryland will be handled by the **Jackson-Walter Co.**, 210 N. 13th St., Philadelphia.

Barber-Colman Co., Rockford, Ill., has announced the appointment of **John C. Preston**, Preston Machine Tool Sales Company, as exclusive distributor for Barber-Colman hobbing machines, hob sharpening machines, hobs, cutters, and reamers in the State of Texas.

Kenneth F. Whitfield, formerly assistant general sales manager, has been appointed advertising and sales promotion manager of Walker-Turner, Division of Kearney & Trecker Corp., Plainfield, N. J. Mr. Whitfield is a graduate of Newark College of Engineering and has worked in an executive capacity with Walker-Turner for 15 years.

Fred L. Stuart, P. O. Box 583, Grand Central Station, New York 6, N. Y., has been appointed United States representative for **S. Wolf & Co., Ltd.**, London W 5, England, manufacturer of portable electric tools.

In its third expansion since organizing in 1943, the **Marvel Engineering Company**, maker of Synclinal filters, has moved into larger quarters at 625 W. Jackson Blvd., Chicago 6, Ill., where more than five times the area of that of the former plant is available.

Paul E. Chatelain & Co., American Bldg., 4 S. Main St., Dayton 2, Ohio, has been appointed representative for Southern Ohio and Kentucky for the line of Swiss precision machinery and tools now being distributed by the recently formed **Hauser Machine Tool Corporation**.

Frank E. Shurts, president of the American Swiss File & Tool Co., Elizabeth, N. J., has announced the appointment of **Harry C. Goodale, Jr.** as the company's Middle Western representative. Mr. Goodale, who has recently completed a course of training in the factory at Elizabeth, New Jersey, will make his headquarters in Detroit.



cost you money

DOES INSPECTION

OR

save you money?



Old-fashioned methods of dimensional inspection definitely increase your costs — because they find errors only *after* the scrap and rework are made.

An inspection system should catch the errors *before* they happen! Visible gaging — Dial Indicator Gaging — offers major advantages over old-fashioned, *feel-your-way* methods.

The Dial Indicator gives you the reading at a glance. Human error is minimized; the sense of sight is more dependable than the sense of feel. Moreover, if the workpiece is off-size, the Dial Indicator tells you exactly which way and exactly how much. This means greater

salvage, less scrap.

In the photograph above, you have an application of the Dial Indicator to the gaging of inside hole diameters. There are no blind spots for this gage; it tells you the exact dimension — in .0001" — and every variation. These gages are available in both portable and bench models — to inspect holes ranging from .122" to 12.665" in diameter. For further details, please write for illustrated Bulletin No. 51.

We make both regular and custom-built gages to meet the needs of users in hundreds of industries. Let us help you with any problem of gaging and inspection.

FEDERAL

FEDERAL PRODUCTS CORPORATION

1144 Eddy Street, Providence 1, R. I.



YOUR PROFIT DECISION IS *Visible** PRECISION

*The use of Dial Indicator Gages—visible precision —lowers inspection costs, raises production. Federal Products Corporation is America's largest maker of both regular and custom-built gages—mechanical, air, electronic — for the measurement of single and multiple dimensions.

Represented in Canada by RUDEL MACHINERY COMPANY, LTD.

Did You Know? ---

The Fletcher F. Milligan Co., 4614 Prospect Ave., Cleveland 3, Ohio, has been appointed Northern Ohio sales representative for The Cleveland Tapping Machine Co., Hartville, Ohio, E. G. Gauspohl and Associates, 2712 Erie St., Cincinnati 8, Ohio, is now Cleveland representative in Southwestern Ohio, Southern Indiana, and Kentucky, with Breen & Ahlers Sales Co., 927 Brookview Ave., Dayton, Ohio, acting as sub-agent in the territory adjacent to Dayton and Columbus.

According to an announcement made by Foye P. Hutchinson, president, David K. Colesberry, for 22 years with The Sharples Corp., Philadelphia, has been appointed general sales manager of The Harrington & King Perforating Co., Chicago, Illinois.

The Putnam Tool Co., Detroit, manufacturer of end mills and other cutting tools, is again in production after suffering an estimated \$300,000 damage to its plant resulting from a mid-air collision and subsequent crash of two Navy fighter planes over Detroit on June 23.

The Hauser Machine Tool Corporation has appointed the Krause Machinery Co., 90 West St., New York 6, N. Y., as exclusive agent in the New York City Metropolitan territory and in the Northeastern part of New York State for its line of precision jig borers, jig grinders, profile projectors, optical hardness testers, automatic profiling machines, pivot polishing machines, and so on.

The Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., has appointed Crozier S. Wileman as district sales manager at Wilkes-Barre, Pennsylvania, to succeed A. C. Williams, who has retired after 43 years of service.

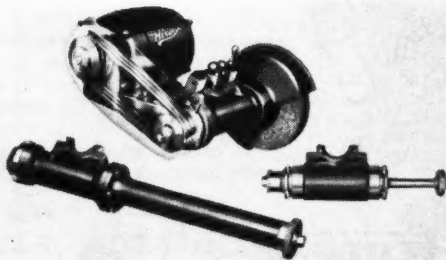
At a board of directors meeting held recently, Whitley B. Moore was elected vice president in charge of sales for The Timken Roller Bearing Co., Canton 6, Ohio, succeeding L. M. Klinedinst who retired after 43 years of service.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., manufacturer of milling, drilling, and boring machines, has purchased The Cincinnati Planer Co., Cincinnati, Ohio, producer of planers, boring mills, and planer type millers.



THE *Hisey* WIDE RANGE PRECISION GRINDER *versatile & rugged!*

• The indispensable tool for use with lathe, boring mill, planer, milling machine and other machine tools for all sorts of internal, external and surface grinding jobs. Interchangeable Grinding Heads permit widest application to production and tool room operations. Full details and specifications are yours for the asking. Write for Catalog 70AT.



**The Hisey-Wolf Machine Co.
Division of SMITH & MILLS Co.
Cincinnati 25, Ohio**

Hisey patented Precision Grinder set up for external grinding.

BARNES BAND SAWS

for

**SMOOTH, EASY and
TROUBLE-FREE
CUTTING**



Production men have found by experience that one way to help eliminate troublesome blade failures and frequent blade changes on band saw machines is to apply Barnes blades. These are the blades that cut with greater efficiency even at standard speeds and feeds . . . that don't have to be overloaded to accelerate production or cut particularly tough metals.

Let Barnes band saw blades . . . noted for their smoother, easier cutting and trouble-free, economical performance . . . prove their qualities on your band saw operations. Check your needs with your Barnes Distributor who carries a complete line for every metal cutting requirement.

BARNES BAND SAW BLADES

- **HARD EDGE FLEXIBLE BACK**

. . . for general all-purpose cutting

- **ARC-LINE**

. . . for all contour, die-cutting and similar applications

- **SKIP-TOOTH**

. . . for high-speed sawing of soft non-ferrous alloys, plastic, fibre, etc.

- **SPRING-TEMPER**

. . . for thin sheet metal, tubing, etc.

The Barnes "Handbook of Metal Sawing" will help you get maximum efficiency from your band saw. Write on your letterhead for your free copy.



*Established
1919*

W. D. BARNES CO., INC.

1297 TERMINAL AVE.

DETROIT 14, MICH.

Did You Know? ---

The **MacMillin Engineering Corporation** with offices at 208 LaSalle St., Chicago, Ill., and headed by **Howard F. MacMillin**, former president of the Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, has been appointed sales representative in the Chicago area by the Gerotor May Corporation, which offers a complete range of pumps, motors, valves, and cylinders for industrial application.

The **John S. Barnes Corp.**, 301 S. Water St., Rockford, Ill., manufacturer of hydraulic structures, pumps, controls, and fluid power units, has appointed **Nielsen Hydraulic Equipment, Inc.**, 441 Lexington Ave., New York 17, N. Y., as its sales representative for the territory including Metropolitan New York and the eastern inders for industrial application.

Dr. William Marsh Baldwin, Jr., an associate of Chase Brass & Copper Co., Cleveland, for some years, has been made research professor of metallurgy at Case Institute of Technology, Cleveland. He was graduated from Rensselaer Polytechnic Institute in 1936 as a chemical engineer.

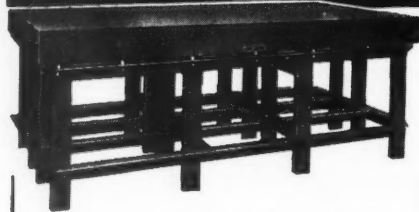
A. Ray MacPherson, formerly associated with the Standco Brake Lining Co., Houston, Tex., as sales manager, as well as with Raybestos-Manhattan for many years in various capacities, has joined the Thermoid Co., Trenton, N. J., as manager of its industrial friction materials sales division.

The appointment of **Myron S. Curtis** as director of engineering of The Warner & Swasey Co., Cleveland, Ohio, has been announced following a meeting of the board of directors at which Mr. Curtis and **Frank E. Joseph**, a member of the law firm of Jones, Day, Cockley, and Reavis, were elected directors.

Thor M. Olson has resigned the position of vice president in charge of sales of the Ex-Cell-O Corp., Detroit 32, Mich., after having been with Ex-Cell-O since April 30, 1930 when his company, the Continental Tool Works, merged with the larger corporation.

The American Society for Metals has announced that **Willard H. Dow**, president of the Dow Chemical Co., Midland, Mich., has been elected to receive the Society's Medal for the Advancement of Research for 1948.

"Precision Equipment by CHALLENGE"



**MEANS ACCURATE
Trouble-Free PRODUCTION**

CHALLENGE Semi-Steel Layout Surfaces PLATES

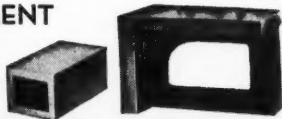
Insure the accuracy of repeated assemblies and layouts. True rigid surfaces

of fine grained special analysis semi-steel and with precision ground or planer finish. Deep ribbing of the 6 inch deep plates prevent sagging or yielding under load. Furnished in 13 standard sizes with or without sturdy arc-welded steel stand with lock-leveling screws.

503

CHALLENGE SURFACE PLATE EQUIPMENT

Made of fine-grained special analysis semi-steel castings. Specially heat-treated and precision ground to required accuracy. **SOLID and BOX PARALLELS, ANGLE PLATES, V-BLOCKS and UNIVERSAL IRONS** in a wide range of sizes. Write today for latest Catalog!



THE CHALLENGE MACHINERY CO.

GRAND HAVEN, MICHIGAN, U. S. A.

LONGER LASTING!

WILLIAMS SOFT-FACE HAMMERS
with interchangeable tips
★ FOR EVERY INDUSTRY ★ FOR EVERY JOB



• SIX SIZES • FOUR HARDNESSES • ELEVEN WEIGHTS

● Williams Soft-Face Hammers are the answer to industry's demand for a hammer that will be more durable than rawhide, rubber, babbitt, lead or wood and still not mar, cut or damage delicately painted, polished or plated surfaces.

Williams Soft-Face Hammers deliver maximum impact with minimum effort...no sting...no vibration...no rebound. They reduce worker fatigue and are also real safety tools. Will not chip or create flying particles to endanger employees' eyes. "Nuplaflex" is electrically non-conductive; it will not spark, thus minimizing danger of fires or explosions.

Replaceable, interchangeable tips made of either "Nuplaflex" or Nylon. "Nuplaflex" is an amazing new slow resiliency, self healing material that is highly resistant to oil, gasoline, common industrial solvents and acids. Three degrees of hardness: Soft, Medium and Tough. For extra hardness specify Nylon tips.



OPEN END, BOX, ADJUSTABLE AND RATCHET WRENCHES; DETACHABLE SOCKETS AND SETS; IMPACT SOCKETS; TOOL HOLDERS; LATHE DOGS; "C" CLAMPS; CHAIN PIPE TONGS AND VISES; FLANGE JACKS; PLIERS; SCREWDRIVERS; PUNCHES AND CHISELS; SOFT FACED "NUPLAFLEX" TIPPED HAMMERS; HOIST HOOKS; EYE BOLTS; ROD ENDS; CRANK AND BALANCE HANDLES; THUMB SCREWS AND NUTS.

J. H. WILLIAMS & CO., BUFFALO 7, N. Y. *Distributors Everywhere*

1 one look one blade



**all cutting jobs
DONE FASTER
with the new
VICTOR wall chart**

With this new Victor Wall Chart near the tool crib or in your machine shop, it takes only one look to find the one blade that's best for the given job. And, once you use it, all jobs can be performed much faster, with fewer rejects and broken blades.

Besides showing you how to match blades to materials, this attractively printed, 17 x 22 inch Victor Wall Chart gives you valuable information on the care and use of the blades themselves—tips that are very valuable in cutting blade costs.

It's all yours, too, absolutely FREE. Simply write on your letterhead to your Victor supplier or to the address below. *The supply is limited.*

This is but one of the many helps offered by Victor supplier. He is the right man to see for the right blade. He has the complete Victor line—a blade for every job a hack saw or a band saw can do. No matter what you cut in the way of metals, plastics, or other non-metallics—there's a Victor blade to cut it faster, cleaner, and last longer. See your Victor supplier for the best blades.

VICTOR  **SAW WORKS, INC.**
MIDDLETOWN, N. Y., U. S. A.

A line of Hand and Power Hack Saw Blades, Frames and Band Saw Blades

Did You Know? ---

The Crocker-Wheeler Electric Manufacturing Co., Ampere, N. J., has announced the appointment of **Ralph S. Drummond**, former sales manager of the Dynamotor Corporation, as manager of the Cincinnati Crocker-Wheeler branch office.

To provide improved service on Oillite heavy duty oil cushion bearings and finished machine parts, the plant of **The Amplex Division, The Chrysler Corp.**, 6501 Harper Ave., Detroit, Mich., has been enlarged and new equipment installed.

Anderson & Clark, 607 Wysor Bldg., Muncie, Ind., has been appointed representative in the State of Indiana for the **Hauser Machine Tool Corporation**, distributors of Swiss machinery and tools.

The U. S. Rubber Co., Rockefeller Center, New York, has announced the appointment of **Jack Suttie** as special grinding wheel representative for the Middle West and Southwest.

Kennametal Cemented Carbide Products. A 72-page catalog presenting information on a complete and diversified line of cemented carbide tools is now being offered by Kennametal Inc., Latrobe, Pa. Featured are Kennamatic tools (5 styles) having indexable and replaceable solid Kennametal inserts, mechanically-held in a vertical position; Kendex tools (4 styles) having indexable, replaceable flat Kennametal tips, mechanically-held to shanks as small as 1/8 inch square; planer tools (5 styles) for heavy and medium heavy duty planing of cast iron; roll-turning tools for roughing, finishing, and fillet-forming of cast iron mill rolls; and axial face Kennamills for the production milling of cast iron and designed for quick resharpening on a standard tool and cutter grinder. Other items presented for the first time or of which expanded lines are shown include screwed-on pulley grooving tools, piston grooving blades, feed finger pads, and bushings. Diversified suggestions for wear-resistant application of Kennametal are also presented.

Copy of Kennametal Catalog 48 is available to mechanical executives addressing requests on their company letterheads.

Mention **MODERN MACHINE SHOP** when writing to advertisers.

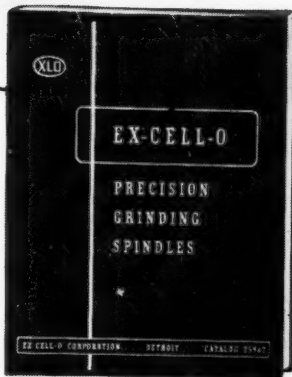
EX-CELL-O

Precision **GRINDING SPINDLES**



The materials used in Ex-Cell-O Precision Grinding Spindles and Ex-Cell-O High Speed Precision Ball Bearings are the finest; the manufacturing, heat treating and inspection methods are the most modern; the workmanship is skilled and exacting.

You can apply Ex-Cell-O Precision Grinding Spindles to your machines with the definite assurance that you are using the best!



A new illustrated 80-page, easy-to-use catalog lists Ex-Cell-O Precision Grinding Spindles, spindle brackets and quills, and gives information on their application to grinders, new and old. Included are spindles for internal grinders, universal grinders, surface grinders, tool and cutter grinders, and special applications. For your free copy, write today for Bulletin 25962.

48-41



EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

Mark It for Market

MODEL
175
HYDRAULIC



Modern Marking Machines now enable most manufacturers of metal components to identify their products at trifling cost.

**TRADE MARKS—
MANUFACTURERS—
PART NUMBERS—
PERMANENTLY ROLLED
ON YOUR PRODUCTS
WILL HELP YOU MARKET
THEM.**

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

*Illustrated at the left is
Model 175 Hydraulic
Marking Machine.*

WRITE FOR CATALOG

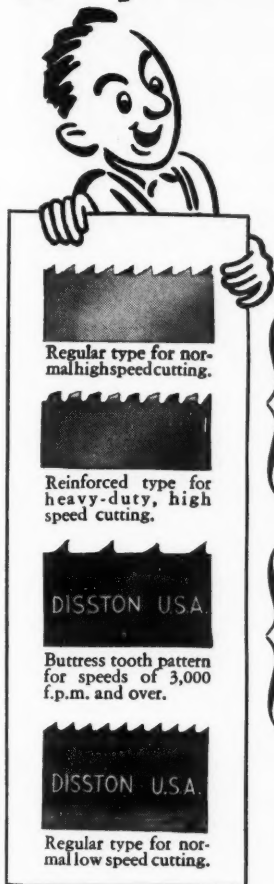


GEO. T. SCHMIDT, INC.

**1806 W. BELLE PLAINE AVE.
CHICAGO • 13 • ILLINOIS**

One of the 4 is **EXACTLY RIGHT**
for your metal cutting...

DISSTON **BAND SAWS**



No matter what metals you cut nor at what speeds you operate, Disston has the right band saw blade to speed up your work, reduce down time and cut costs.

HARDENED THROUGHOUT

For high speed cutting of non-ferrous metals, plastics and many other materials. Two types (Regular and reinforced). Also recommended for friction cutting of ferrous metals at speeds of not less than 12,000 f.p.m. All sizes.

HARD EDGE, FLEXIBLE BACK

Hardened on tooth edge only for greater flexibility and longer life. Two types (Regular type for general metal cutting; Buttress tooth specially recommended for magnesium and aluminum alloys). All sizes. 100 ft. coils, $\frac{1}{8}$ " to $\frac{1}{2}$ ", packed in the handy Disston Safety Reel.

ANOTHER COST-CUTTING TIP

Use these Disston Metal-Cutting Tools:
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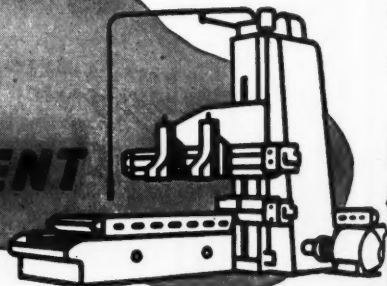
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NEW SHOP EQUIPMENT



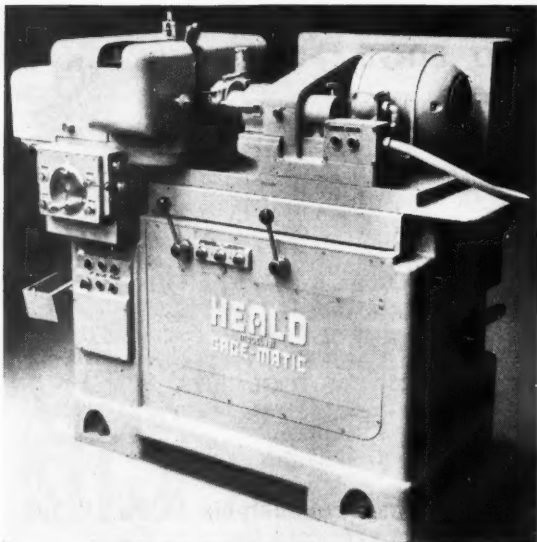
Heald Model 181 Centerless Internal Grinder

Designed especially for small work (up to 4-inch O.D.) which can be rotated on its outside diameter, the Heald Model 181 Centerless Internal Grinder shown herewith, product of The Heald Machine Co., Worcester 6, Mass., incorporates a work-holding and rotation principle that is claimed to provide for the production of uniform wall thickness and accurate concentricity between I.D. and O.D., as well as to permit reloading for multiple

operations without error. Being fully automatic in every element of the grinding cycle, including loading and unloading, the machine is said to be ideally suited to battery operations where one operator handles several machines.

The Model 181 is so constructed that the amount of in-feed diminishes from roughing through finishing feed according to a preset rate, producing a spark-out effect as the desired size is approached. The design also includes an automatic loading and unloading device which is arranged to operate rapidly. A single control knob is used to set the roughing and finishing cross-feed cycle. Table speeds are controlled by individual finger-tip action knobs which are conveniently graduated. The table stroke is set by quickly adjustable self-locking reverse dogs. The roll mechanism can be conveniently and accurately set for straight or taper grinding. All controls are readily accessible and arranged for operator convenience. Knobs and levers are marked to show function.

The Heald Model 181 Internal Grinder is furnished with either Size-Matic or Gage-Matic sizing. Gage-Matic models may also be operated Size-Matically. A



Heald Model 181 Centerless Internal Grinder



Now *all* Starrett Micrometers—including the popular Thimble Friction type and the popular priced Black Frame type—will have the new, non-reflecting Satin Chrome Finish. No more squinting, no shifting to better light... the markings stand out sharp, clear and easy to read under any illumination. And eye-soothing Satin Chrome Finish is highly resistant to stains and corrosion.

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quick flip of a switch is all that is required to change from one sizing cycle to the other.

The part to be ground is held between three rolls and is rotated on its own outside diameter. The compactly constructed wheel dresser of the machine pivots on rigidly mounted preloaded anti-friction bearings for precision size control. The anti-friction workhead cross slide is mounted on a bridge with large way area for maximum rigidity.

Flared steel tubing for hydraulic lines is said to ensure leakproof joints. Valves are mounted on one panel at the front of

the machine, the panel being removable without disturbing pipes. Electrical controls are conveniently grouped in a dust-proof enclosure at the rear of the machine. The power unit is designed for rolling out of the machine base on wheels.

Additional features of the machine include permanently lubricated wheel heads; sealed hydraulic system; isolated hydraulic pump and tank to minimize base changes from heat an disolate a possible source of vibration; rigid box-type base; and smooth table motion.

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Manufactured in all tapers. 1 to 6 MT in stock. Special shanks and points made to order.

PAT. PEND. Points illustrated are standard.

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H-P-M 1,000-Ton Hydraulic Sheet Metal Drawing Press

The accompanying illustration shows a 1,000-ton double-action hydraulic sheet metal drawing press for drawing automotive body parts which has been built by The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. The press weighs 350,000 lb. and includes pressing surfaces of 144 x 84 inches.

Sheet metal parts up to 22 inches deep can be drawn in a single operation using either single or double-action dies. All press actions are hydraulically controlled. The blankholder slide is located directly below the main (punch-carrying) slide. The die cushion platen in the press bed is 124 x 60 inches, with a maximum stroke of 24 inches. The main slide, blankholder, and die cushion pressures are 1,000, 400, and 250 tons respectively. A single H-P-M Hydro-Power variable displacement hydraulic pump generates the pressure for all press actions.

Operating features claimed for the press include adjustable, independent pressure control for each pressing member; constant drawing speed throughout the entire stroke, with maximum pressure obtainable at any point within the limits of the press ram travel; and blankholder pressure which is independently adjust-

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PATENTED CUTTING OFF TOOL HOLDERS PATENTED CUTTING OFF BLADES

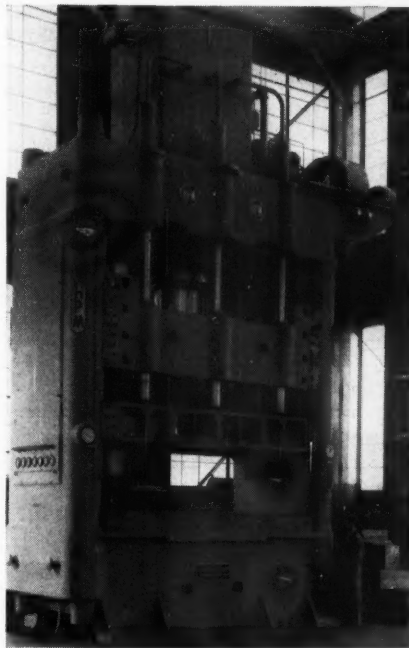
ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured by

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Produced under License Issued by John Milton Luers Patents Inc

able at six points on the periphery of the blankholder slide (especially beneficial when drawing parts of irregular contour and depth, where the blank must flow into the die more freely at certain points). The press can be fitted with many types and sizes of dies for either single or multi-die operations. Blanking, drawing, and embossing can be performed in a single press stroke, if desired. Precision



H-P-M 1,000-Ton Hydraulic Sheet Metal Drawing Press

inching control permits easy die setup.

Designed to eliminate the possibility of overloading dies or press members, the machine provides a steady squeeze of hydraulic pressure which is said to be ideal for drawing operations. Arranged to reverse at either a predetermined position or pressure, the press is adaptable to many sheet metal drawing operations.

Sebastian Lathe

American Steel Foundries, King Machine Tool Division, Cincinnati 29, Ohio, is now devoting its plant facilities and

No. 1 in a series of performance case histories.

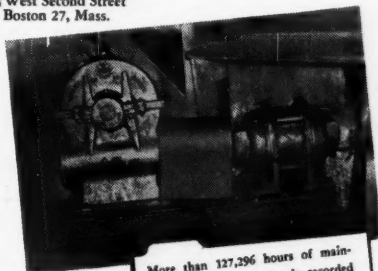
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except lubrication!"*

... reports Massachusetts
leather products manufacturer.

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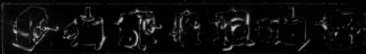
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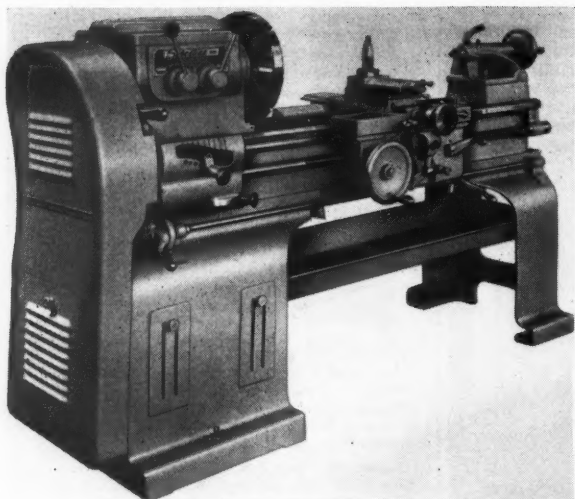
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Sebastian Lathe

variety of types and sizes; namely, general purpose, clutch-and-brake, and line shaft drive types in 12, 16, and 20-inch sizes, as well as gap and metric screw types in 16 and 20-inch sizes. All types and sizes are equipped with 8-speed geared heads.

Outstanding features claimed for the Sebastian Lathe include Timken tapered roller bearings on all shafts in the headstock; apron control for starting, stopping, and reversing the spindle; knob control handle for apron length feed friction; 57 feed and thread changes; and accuracy of 0.0005 inch at every point of

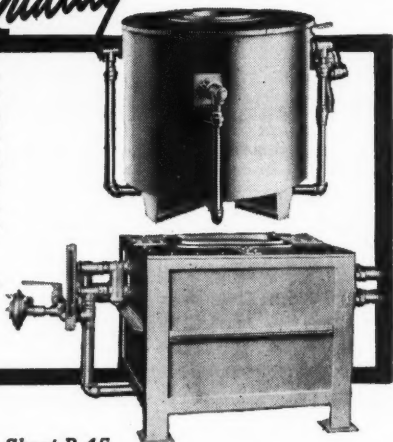
machine tool experience to the manufacture of Sebastian Lathes, in addition to other metal-working equipment. King-made Sebastian Lathe is available in a

alignment. Standard equipment of the machine includes apron control, steady rest, threading dial, and two faceplates, as well as other items.

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The facts of life regarding the protection, strengthening, salvaging and repair of tapped threads are now available in this new bulletin. It describes the use of Heli-Coil Inserts in steel, cast iron, aluminum, magnesium and other ferrous and non-ferrous metals—as well as plastics, wood and other non-metallic materials. Send for it.

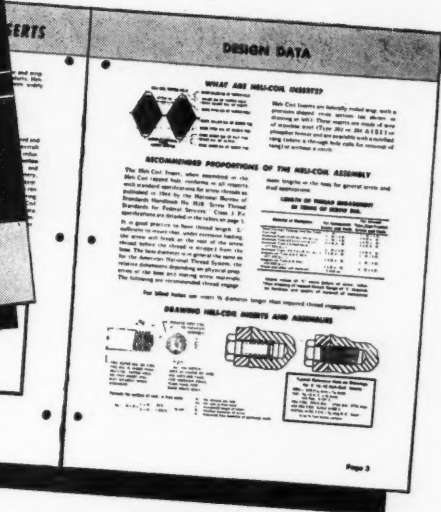


Fig. 1. S. Per Co.

The Heli-Coil® Screw Thread Insert, invented just before World War II, was used almost entirely on aircraft engines during the war. But, after V-J Day, manufacturers of all types of products involving the use of threaded fastenings began to take advantage of the improvement offered by these Inserts. In appliances, automobiles, industrial machinery and many other applications, Heli-Coil Inserts were quickly adopted for the protection,

strengthening and repair of tapped threads and for simplification of design.

Bulletin #248, just off the press, is a compact booklet containing complete information regarding design, specifications and installation data for Heli-Coil Screw Thread Inserts. It is offered free of charge to design engineers and others who are interested in the design, manufacture and inspection of products containing threaded fastenings. Send for your copy today.



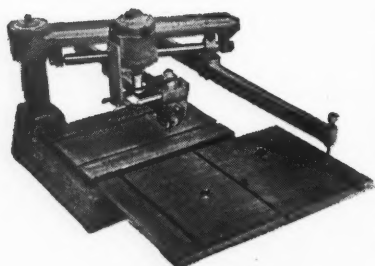
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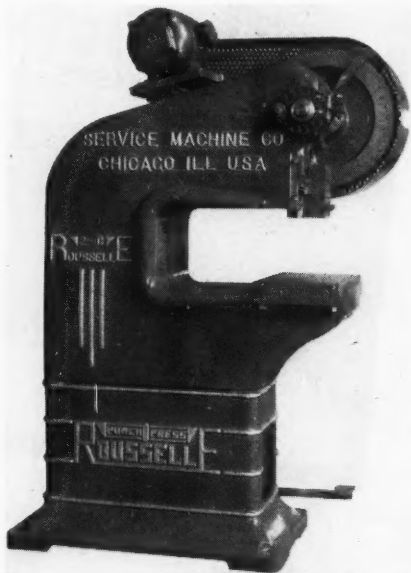
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Pantograph Controlled Model PE-1. Engraves an area 5 by 5 inches on curved surfaces without special templates, with smooth lines in any design, number, letter; on iron, brass, copper, aluminum, soft steels and all plastics. • Drills a series of holes • Profiles small parts • Increases accuracy and production • Works from original drawing or templates • Etches glass and similar items • Will not cause distortion. For information and prices write Dept. M.

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Rousselle No. 2-G Deep Throat Press

Identified as the Rousselle No. 2-G, a 15-ton deep throat press has been added to the line of open back inclinable and adjustable bed horn punch presses manufactured by the Service Machine Co., 7633 S. Ashland Ave., Chicago 20, Ill. The press features an 18-inch throat which permits working to the center of 36-inch sheets, thus making the machine parti-



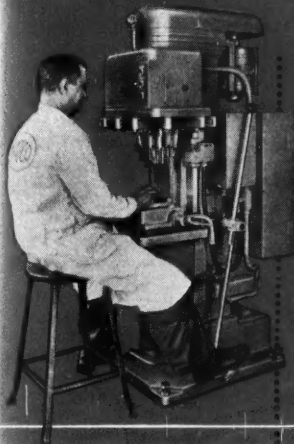
Rousselle No. 2-G Deep Throat Press

cularly useful for sheet metal and other fabricating shops.

The bolster plate measures 11 x 16 inches, and the shut die height of the press is 7 3/4 inches to the bed. The machine has a standard 2-inch stroke, thus making it adaptable to a wide variety of work. The frame is a one-piece semi-steel alloyed casting of generous proportions, providing rigidity and strength with a minimum of deflection. The frame is designed so that the bed protrudes to allow clearance for some jobs that would ordinarily require horn presses. The bed has a 6-inch opening to permit blanks and slugs to fall through.

The Rousselle No. 2-G Deep Throat Press is equipped with a single stroke or

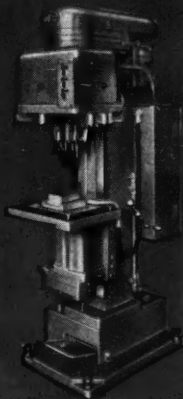
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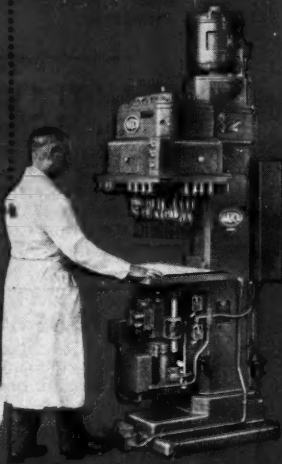
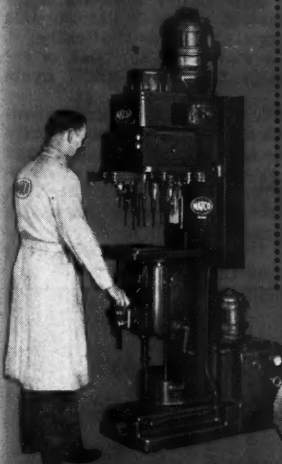


♦ **G-5** Arranged with 12 spindles for drilling and tapping small or medium sized work. Hand & foot or hydraulic feed tables.

♦ **G-6** Similar to G-5 except has larger hand arm, 24 spindles and 3HP hand drive motor and larger work table.

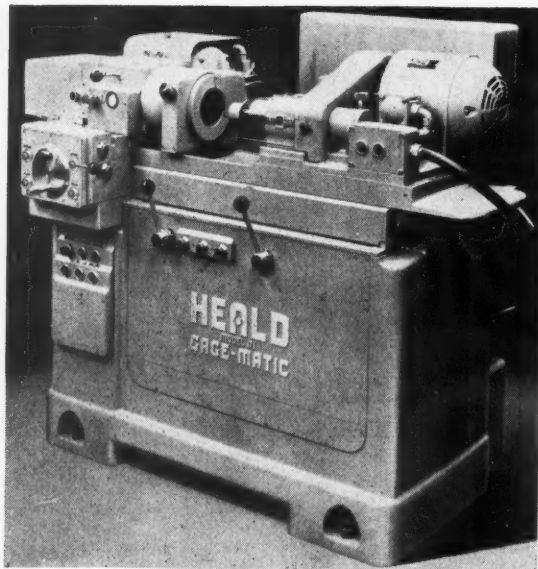
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Call a Natco Field Engineer



**Heald Model 171 Chuck Type
Internal Grinder**

continuous clutch, roller bearing fly-wheel, large air-cooled brake, and hinged motor mount. The machine is designed to operate at a speed of 200 r.p.m. with a 1 h.p. 1,750 r.p.m. motor and weighs 1,875 lb. complete.

Heald Model 171 Chuck Type Internal Grinder

Specifically designed for small work (up to 2-inch I.D.) and large-lot production, a chuck type internal grinder designated as the Model 171 is announced by The Heald Machine Co., Worcester 6, Mass. The machine is so constructed that

justable self-locking reverse dogs. The workhead can be conveniently and accurately set for straight or taper grinding.

The Heald Model 171 Internal Grinder is furnished with either Size-Matic or Gage-Matic sizing. Gage-Matic models may also be operated Size-Matically. A quick flip of a switch is all that is required to change from one sizing cycle to the other.

The compactly constructed wheel dresser of the machine pivots on rigidly mounted preloaded anti-friction bearings for precision size control. The anti-friction workhead cross slide is mounted on a bridge with large way area for maximum rigidity.

Flared steel tubing for hydraulic lines

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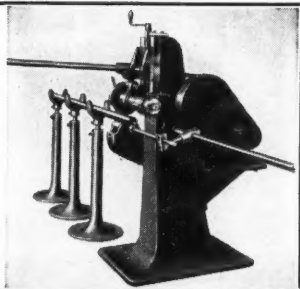
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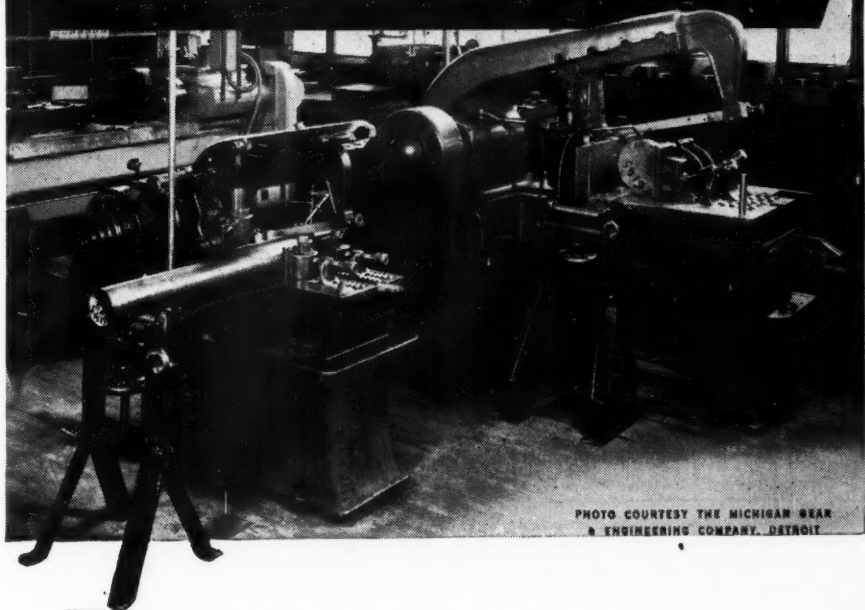


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THE Michigan Gear & Engineering Company of Detroit selected RACINE machines in two sizes for quantity output of gear blanks. The accuracy of this equipment, producing straight, clean cuts, reduces the cost of subsequent machining operations. RACINE machines are accurate because hydraulically applied feeds provide a flexibility that protects the blade against shock and strain. The blade always cuts at its maximum without flexing or crooked cutting.

The high production capacity, modest first cost and the low maintenance on RACINE machines recommend them to your use. Available in all capacities from 6" x 6" to 20" x 20". Early deliveries on single purpose, automatic bar feed units and special machines for unusual jobs. Get the full RACINE story by writing today. Free No. 12 catalog. RACINE TOOL & MACHINE CO., 1770 State Street, Racine, Wisconsin.

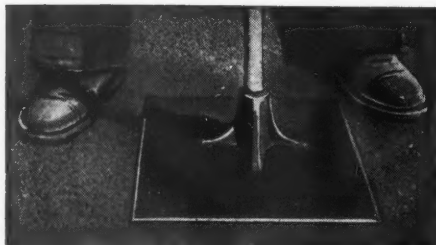


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is said to ensure leakproof joints. Valves are mounted on one panel at the front of the machine, the panel being removable without disturbing pipes. Electrical controls are conveniently grouped in a dust-proof enclosure at the rear of the machine. The power unit is designed for rolling out of the machine base on wheels. Additional features of the machine include permanently lubricated wheelheads; sealed hydraulic system; isolated hydraulic pump and tank to minimize base changes from heat and isolate a possible source of vibration; rigid box-type base; smooth table motion; and electrical system designed to meet generally accepted codes and to simplify electrical maintenance.

Hoffman Oil Conditioner

The Hoffman Oil Conditioner, a portable self-contained unit for the complete purification of transformer, circuit breaker, cable, refrigerator, vacuum pump, turbine, and other oils and available in capacities up to 600 g.p.m., is announced by the U. S. Hoffman Machinery Corp., Filtration Division, 219 Lamson St., Syracuse 6, N. Y. The unit is described as a combination of a Hoffman vaporizer and a cartridge filter mounted on a common base and arranged to afford operation of the filter and vaporizer independently or together as application warrants. The filter and vaporizer are available separately as complete units in a wide range of sizes.

Designed for the removal from oil of all insoluble contamination, the cartridge filter is offered in two types, one of which utilizes 11 x 18-inch cartridges and may be obtained in 1, 2, 3, 4, 6, and 8-inch cartridge units. The other type utilizes 7 x 18-inch cartridges in multiples of 1, 2, 4, 7, 9, 14, and 18. The 11 x 18-inch cartridges, of either repackable or throwaway types (which are interchangeable) utilize fuller's earth or bauxite for removal from oil of both insoluble material and acid contamination, or may be packed with cellulose or waste if insoluble removal only is required. Features of the repackable cartridges include a special insulated head which is said to ensure maximum heat efficiency, a wing nut head construction to facilitate cartridge clamping, and a spring-and-plate construction within the cartridges to assure their consistent packing. The 7 x 18-inch cartridges are available only in the throwaway cellulose type. All filters are obtainable with or without electric heaters, steam or hot water jackets.

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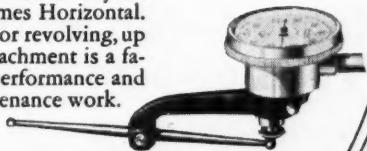
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The highly accurate, highly sensitive Ames Horizontal is the right indicator for right-angle readings. It is invaluable for tool room and production jobs where it is advantageous to have the dial in a horizontal plane, and on work surfaces where the use of regular indicators is impractical.

The Ames Horizontal is designed with the usual Ames approach of *sustained accuracy through simplicity*. Action is obtained through a rack and pinion—there are no spirals, cams or levers which might introduce wear and incorrect dial readings. Because of its sturdy, forged brass construction, any surface of the case may be used for mounting—or the regularly supplied holding rod may be used.

Be sure you're right at right angles, specify Ames Horizontals. Write for new bulletins describing all sizes and models of this modern gauge.

A Universal or Hole attachment may be clamped to the stem of the Ames Horizontal. It will check holes, stationary or revolving, up to 1 3/4" deep. This Ames attachment is a favorite for speeding up the performance and accuracy of service and maintenance work.



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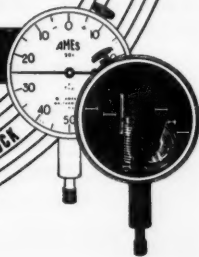
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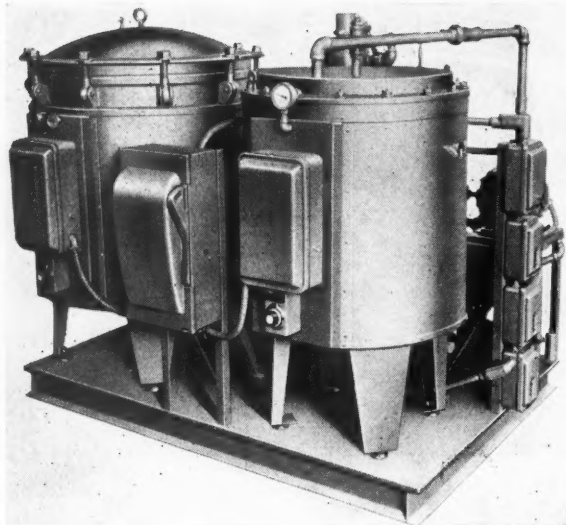
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Hoffman Oil Conditioner

other elements not affected by the cartridge filter is said to be accomplished by the vaporizer. This unit is represented as a specially designed cylindrical tank constructed to operate continuously under 26 or 27 inches of vacuum and containing a tier of unique removable metal trays which provide maximum surface exposure. Oil is introduced by a positive displacement inlet pump and a vane-type vacuum pump alone when the vaporizer is used independently. The oil is pumped through a pre-heater and a distributor head into the electrically-heated and thermostatically-controlled vacuum

Removal from oils of air, volatile organic acids, fuel dilution, undissolved gases, water (free or emulsified), and

chamber. Here it flows by gravity in a thin film over the trays, where the action of the heat causes the rapid evaporation

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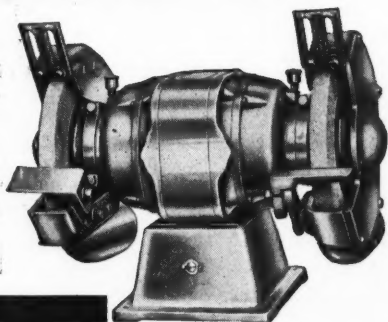
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WORLD'S LARGEST PRODUCER OF SMALL PUNCH PRESSES

of soluble impurities from the oil. Upon reaching the outlet, the oil is picked up by a rotary discharge pump and sent back through the heat exchanger into the system or into the clean storage tank.

Among the advantages claimed for the vaporizer are that the inlet flow is automatically regulated by a float control; the pumps are the only moving parts; the controllable flow valve is the only valve required other than drain valves; electrical connections only are needed to effect operation; the heat exchanger serves the double purpose of heating the incoming and cooling and outgoing oil; sep-

arate thermostats and controls on both the preheater and the vaporizer ensure accurate temperature control; and various size vaporizers (from 50 to 600 g.p.h. capacity) are available. An advantage of both the cartridge filter and the vaporizer is that the leg-type construction provides for simplicity of piping and facilitates cleaning.

Cooley Model VK-6 Electric Box Furnace

Accurately controlled temperatures in the range from 2,000 deg. F. to as low as 300 deg. F. are available in the Cooley Model VK-6 Electric Box Furnace illustrated herewith, product of the Cooley Electric Manufacturing Corp., 34 S. Shelby St., Indianapolis 7, Ind. This broad range permits not only hardening and other high temperature work but also low temperature applications such as tempering or drawing of steels, non-ferrous heat treating, and so on.

Having an 8 x 6 x 14-inch chamber, the Model VK-6 is said to be useful for tool and die work, production heat treating of small parts, running pilot lots, emergency repairs, industrial and laboratory testing, and other work within its range where controlled heating is essential. The Model VK-6 is made with a simplified vertical lift door having an exterior mechanism and counterweights. The vertical sliding door is said to conserve heat when charging small parts since only a limited portion of the chamber need be exposed. The power capacity of the furnace is 4,650 watts. Since only 2½ kw. are required to maintain a temperature of 2,000 deg. F., ample capacity is said to be available for heating whatever work is charged. Rapid and uniform heating is claimed to be assured by six embedded-type heating elements, including one in the door. The furnace is said to heat from



REPLACES . . .

10 SINGLE - PURPOSE TOOL HOLDERS

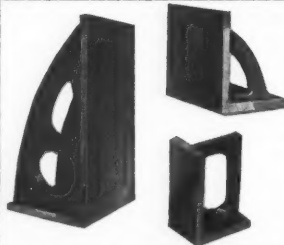
Round boring bars and internal threading tools can be used in the same tool holders.

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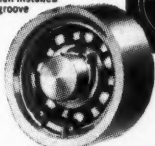
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Forms secure shoulder,
gives tight pressure
fit when installed
in a groove



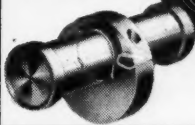
Beveled* and Bowed*

Take up end play rigidly
or resiliently, accommo-
date accumulated
tolerances



Crescent

Snaps on radially where
axial assembly is impos-
sible. No special
tools needed



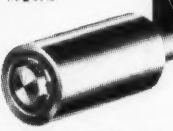
E-Ring

Provides large strong
shoulder for small shafts.
Applied radially.



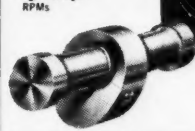
Self-Locking*

Economical where thrust
is moderate—holds fast,
yet shaft requires
no groove



Interlocking

2 piece ring takes heavy
thrusts, gives posi-
tive lock, secure
against high
RPMs



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corner radii, uniform
shoulder for curved
abutting surfaces.



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Waldes Kohinoor, Inc., 47-10 Austel Place
Long Island City 1, N. Y.

MM-9

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Over 70 Years
New Haven 5, Connecticut U.S.A.

cold to 2,000 deg. F. in $1\frac{1}{2}$ hours, or in only half this time after overnight shut-down. Continuous operation at 2,000 deg. F. is claimed to be possible with the Model VK-6, which draws 20.2 amperes at 230 volts.

Highly accurate temperature control down to as low as 300 deg. F. is available, since the furnace is equipped with a Cooley selective power modifier. Used in combination with an indicating-controlling pyrometer, this unit permits meet-



Cooley Model VK-6 Electric Box Furnace

ing very critical temperature requirements. Power input may be adjusted to balance furnace heat losses, and low temperature overshooting of the pyrometer is said to be eliminated. Moreover, the modifier is claimed to prevent the furnace from running to destructive temperatures in the event of pyrometer failure. The modifier unit consists of a synchronous motor driven, cam-operated switch which can be selectively set to maintain the power from 5 to 100 per cent of capacity, a dial control, relay, and pilot light, all mounted integrally on the front panel below the furnace door.

Either a wall mounted pyrometer or the illustrated control panel may be employed with the Model VK-6 furnace. Enclosed and self-contained, the latter is



Courtesy of Ford News Bureau

NO SLOWDOWN UNDER LOAD on production line

Because the 180-cycle induction motor maintains a constant rotor speed of 10,800 R.P.M. *under all loads*, CP Hicycle Portable Electric Tools assure maximum output on the production line. Light weight and ease of handling minimize operator fatigue.

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For full information on the CP Hicycle line of heavy-duty Drills, Grinders, Reamers, Screw Drivers, Nut Runners, Stud Setters, Tappers, Sanders, Buffers, Polishers — write today for a copy of Catalog 900, "Hicycle Portable Electric Tools for Industry."



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ABRASIVES**

completely wired with a Taco West
"Veri-tron" electronic-operated pyrome-
ter, breaker-type switch, and fuses.
When mounted with the panel and steel
stand assembly, the furnace can be in-
stalled or moved where desired by con-
necting two line wires.

Diamonett Model 47-B Lens Curve Generator

The Penn Optical & Instrument Co.,
Pasadena, Calif., announces the Dia-
monett Model 47-B Lens Curve Genera-
tor, a versatile machine that is designed
to serve as both a precision and prescrip-
tion optical lens curve generator. A high



Diamonett Model 47-B Lens Curve Generator

output machine, semi-automatic in oper-
ation, the Diamonett can be quickly ad-
justed to generate any prescription or
specification.

The spindle and workhead, as well as
the tub, are fine-grained gray iron cast-
ings, normalized before machining to re-
move internal stresses. Sliding surfaces
and mounting faces are hand scraped for
accurate fit and alignment. The heavy

Emboss Your Own Metal Tags

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**Get a Completely
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See this and other advanced Pannier marking machines at Booths 252 and 253, Iron and Steel Institute Show, Cleveland, Ohio, September 28 to October 1. Or write for complete information.

Up to 20 characters at a time are embossed on 50 metal tags per minute with this efficient, easily-operated Pannier "Master Marker." Characters are carried on interchangeable slides and positioned by hand wheels on side of machine head. Die slides are engraved to specification—including standard code characters of the Concrete Reinforcing Steel Institute. Reels of plain or punched tag blanks, nicked and notched for easy separation, are supplied by Pannier, and mount on machine for safe, convenient feeding into dies. A rewind reel is also available. Machine is available with foot or power operation.

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Philadelphia, Pa.



THE PANNIER CORPORATION

202 Pannier Building

Pittsburgh 12, Pa.

wheel spindle is of non-symmetrical design to eliminate harmonics and vibration. The swivel workhead can be adjusted to any angle up to 50 deg. each side of center.

Coolant is supplied by a built-in gusher type pump with the reservoir housed in the base. The coolant is pumped through the hollow wheel spindle from the rear to be discharged against a special baffle in the wheel adapter that forces the coolant outward to flood the area of contact between the grinding wheel and the work.

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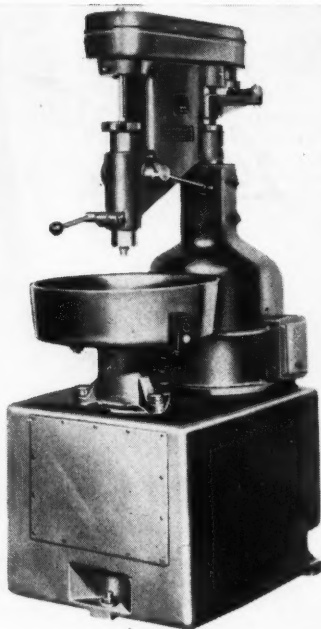
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MACHINE
WORKS

WALTHAM,
MASSACHUSETTS

"Microflat" Flat Surface Finishing Machines

The Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich., has purchased the engineering drawings and



"Microflat" Machine for Finishing Flat Surfaces Regardless of Shape or Size of Part

patterns of the Ultra Lap Company and announces the manufacture of a new line of machines under the trade name of

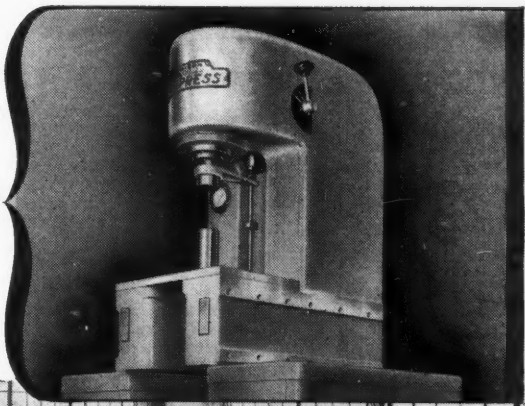


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There's no obligation when you accept our invitation to use this Denison service. Just send your material and the necessary dies, along with an engineer or someone familiar with the technical requirements of your project—and expect to be pleasantly surprised! All laboratory work of this nature is, of course, strictly confidential. To arrange a MULTIPRESS laboratory testing schedule for your product, write or call The Denison Engineering Company.

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 1153 DUBLIN ROAD, COLUMBUS 16, OHIO

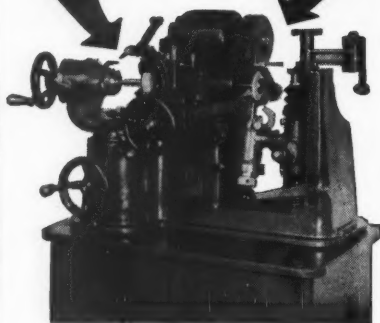


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SHARPENS FLUTES,
SPIRAL POINTS
of TAPS



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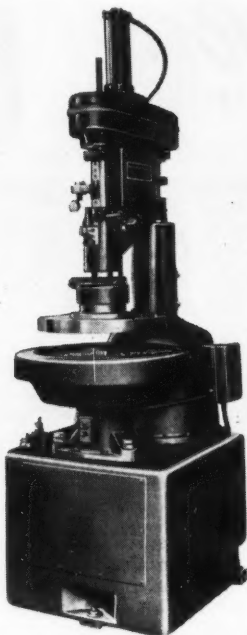
Representatives In Principal Cities

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Cleveland 13, Ohio

"Microflat" for finishing flat surfaces. The present series of six models includes two types of machines both using either bonded or loose abrasives. One machine is designed to finish flat surfaces regardless of the shape or size of the part. The other machine is said to finish two opposite sides of parts simultaneously within 0.0001 inch for parallelism.

One or many parts may be processed simultaneously on the Microflat Ma-



"Microflat" Machine for Finishing Two Opposite Sides of Parts Simultaneously

chines. The surfaces produced are said to be optically flat within one light-band and can be held to a finish of one micro-inch R.M.S. or less if desired. Any material from soft copper to quartz or Nitro-alloy may be finished on the machines.

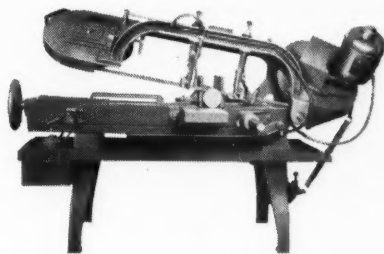
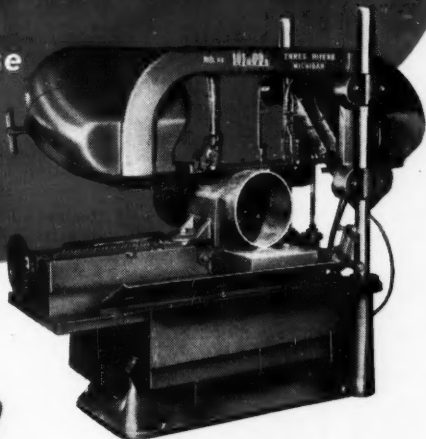
"Standard" Redesigned Combination Grinder-Disc Grinder

The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, announces that it has redesigned its combination

Now YOU CAN HAVE THE ADVANTAGES OF WET CUTTING

... with either of these
popular **WELLS**
METAL CUTTING
BAND SAWS

• **RIGHT** — The heavy duty Wells No. 12 with wet cutting system features an automatic cutting cycle and controlled blade pressure. Capacity is 12" x 16" rectangular; 12 1/2" rounds; die blocks, 12 1/2" deep, 16" wide, 18" clearance, bed to blade.



• **ABOVE** — The versatile Wells No. 8 with wet cutting system. Suitable for production or general utility. Capacity is 8" x 16" rectangular (5" x 24" with special guides); 8" rounds.

BOTH the No. 8 and the new No. 12 Wells Metal Cutting Band Saws are now offered with complete, self-contained Wells wet cutting systems. Experience gained through wide use of this system on the No. 8 saw has proven that it will pay for itself quickly thru production cost reductions. Controlled flow of liquid into cutting area increases blade efficiency and permits safe use of higher i.p.m. cutting speeds. Get full details on this economical extra today and ask about a wet cutting system for your present No. 8 or No. 12 Wells Saw.

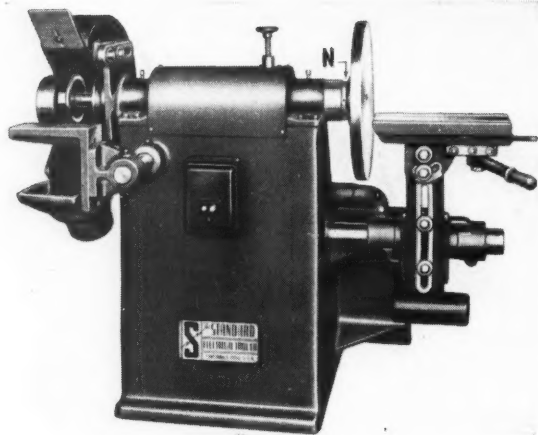
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Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
308 TYLER STREET, THREE RIVERS, MICH.



"Standard" Redesigned Combination Grinder-Disc Grinder

The guards for both the straight grinding wheel and the disc grinding wheel are of structural plate steel. The left-hand end of the machine is arranged to accommodate a maximum size grinding wheel of 24 x 3 x 1½ inches powered by a 10 h.p. motor. The smallest diameter wheel which can be accommodated is 10 inches using a 1 h.p. motor. The right-hand end of the machine is arranged to accommodate plate mounted disc grinding wheels from 24 to 10 inches in diameter, depending upon the size of the machine. Optional equip-

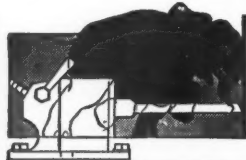
grinder-disc grinder. Features of the redesigned machine include a self-contained belted motor drive and enclosed ball bearing motor which is located on an adjustable bed plate attached to the back of the pedestal. Power is transmitted through multiple V-belts.

ment includes either a lever feed universal table or a plain swivel table.

An outstanding feature of the "Standard" Redesigned Combination Grinder-Disc Grinder is the thrust bearing construction which is said to eliminate the necessity of dismantling the spindle as-

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Horizontal and Vertical



Both models deliver 80 lbs. pressure on a line pressure of 100 lbs. They'll save countless man-hours in assembly operations involving welding, riveting, bolting, etc. **Advantages over mechanical clamps:** 1. Any number can be operated by single master valve. 2. Easily installed in cramped corners. 3. Equal ram pressure at any stroke point. Send for new Mead AIR POWER Catalog, describing our line of Air Clamps, Air Vises, Air Presses, Work Feeders, Valves, Controls, etc.

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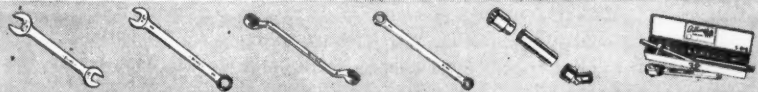
4114 N. KNOX AVE. Dept. AA-98 CHICAGO 41, ILL.

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Mechanics want!*

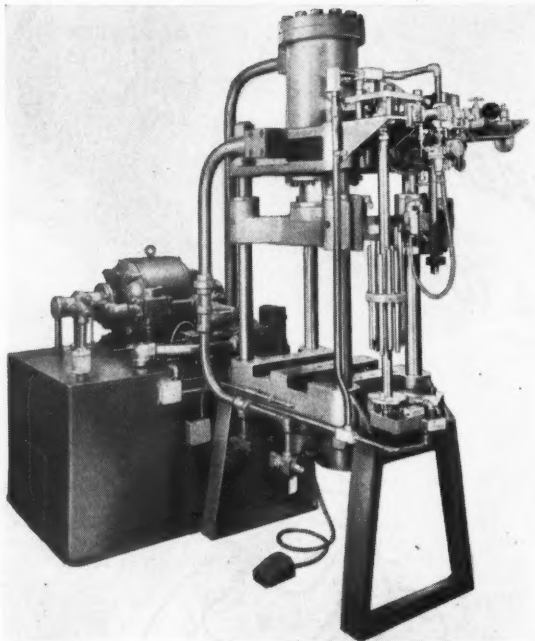


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Elmes Hydraulic Tube-Bending Press

Chicago 7, Ill. According to the manufacturer, the press allows for any number of sequences up to a maximum of 12, with adjustable bending depth and automatic re-start. This feature, together with a choice of four bending radii, provides the user a selection of any or all of 48 possible bending variations for forming exhaust pipes, frames, furniture tubing, and similar products on a mass production basis. The press capacity is 20 tons.

The bed of the Elmes Hydraulic Tube-Bending Press includes two cushions, in line with each of which are two bending noses, each having a different radius. An indexing device is used to control the sequence and depth of bends. After the sequence has been completed, the index is automatically reset to starting position. A foot treadle control is used

sembly to take up bearing wear, this operation now being conveniently effected by an external adjustment.

Elmes Hydraulic Tube-Bending Press

A hydraulic tube-bending press providing an unusually large number of bending combinations has been announced by the Elmes Engineering Works of American Steel Foundries, 1002 Fulton St.,

to operate the press cycle, thereby leaving the operator's hands free to handle tubes.

With the press, different bending combinations can be set up quickly and easily, thereby making it feasible to use the machine for experimental runs as well as production work.

Delta 12-Inch Tilting Arbor Saw

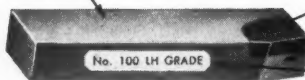
Claimed to have a capacity comparable to that of a saw with a 16-inch blade, the Delta 12-Inch Tilting Arbor Saw illus-

STANDARD CARBIDE BLADES . . .

For All Types of
Milling Cutter Bodies

Check These Advantages:

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Oversize Tip-Diamond Lapped Flush
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We Fabricate All Types of Carbide Tools. Write for Bulletin No. 101
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WISCONSIN CARBIDE TOOL CO., 3345 N. 35th St., Milwaukee 10, Wis.

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TO GET MORE PRODUCTION
FROM EXISTING MACHINES

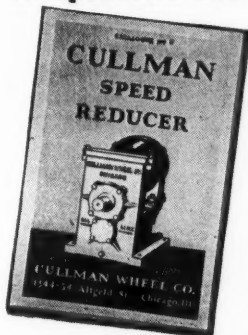
CULLMAN *Speed* REDUCERS

ADAPT ELECTRIC MOTORS TO SLOWER OPERATIONS

New Low-speed Range

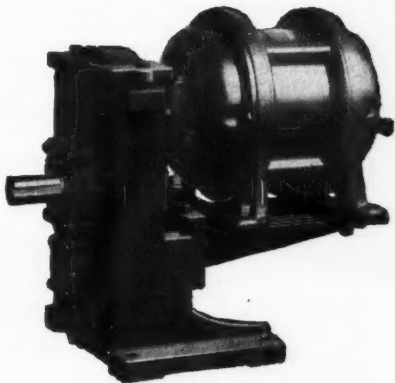
For Motors $\frac{1}{4}$ To 15 h. p.

Fit Speeds To Job Needs



WRITE FOR YOUR COPY...

Get the facts! Ask for this helpful booklet which contains much useful data and facts for buyers. It describes Cullman Speed Reducers and other Cullman products.

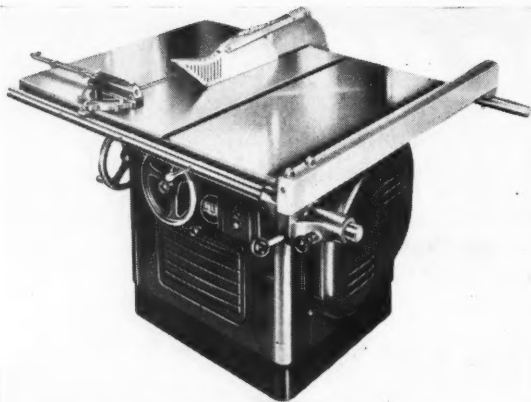


Any standard electric motor can be adapted for many new uses by adding a Cullman Speed Reducer. Compact, dependable, efficient—Cullman Speed Reducers are made in single and double reduction types. Cullman units are equipped with Helical Gears, Roller Bearings, Sprockets and Roller Chains all operating in oil. *Installation is simplified by convenient motor mountings.*

CULLMAN WHEEL COMPANY

1352 V. Altgeld Street

Chicago 14, Illinois



Delta 12-Inch Tilting Arbor Saw

common cradle, the four-belt drive is said to make the machine truly flexible. Its 12-inch blade can be tilted to the right a full 45 degrees, at which angle it may be used to cut stock $2\frac{1}{2}$ inches thick. The arbor is supported on "lubricated-for-life" ball bearings. Work is supported in front of the saw blade by a table space of 16 inches. The table itself is finish ground and is 38 inches long x 4 feet wide.

trated herewith, product of the Delta Manufacturing Division, Rockwell Manufacturing Co., 600 E. Vienna Ave., Milwaukee 1, Wis., can be used with either a 3 or 5 h.p. motor and may be set for speeds of 1,800, 2,400, and 2,600 r.p.m., or more, in cutting aluminum, carbon, wood, and other materials.

With both the motor and arbor on a

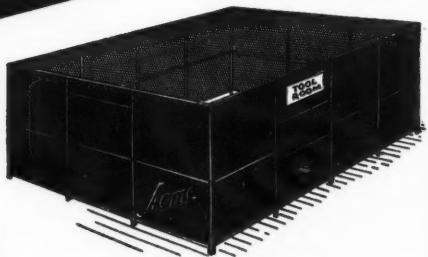
Bliss 500-Ton Hydraulic Die Hobbing Press

The addition of a die hobbing press to its line of hydraulic press equipment is announced by the E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich. Rated at 500 tons pressure at a pressing speed of 2 inches per minute, the press is in-

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TOOL CRIBS and PARTITIONS

Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.



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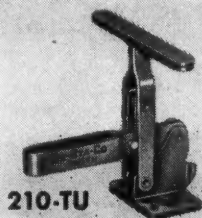
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210-TU



207-S



202

Speed PRODUCTION WITH . . .

DE-STA-CO *Quality* TOGGLE CLAMPS

Your work-holding tools give fast, uniform clamping action—longer life—greater power—because De-Sta-Co's more than forty models give you *quality* features.

- Well-engineered designs, precision-tooled for uniformity.
- Reamed bearing holes for accurate fit, sensitive operation.
- Fool-proof, *positive* toggle action—no cams.
- Friction-relieving off-sets in handles and links.
- Cold drawn solid bars—forged portable clamp parts.

New portable and plunger clamps are coming—to meet your various work-holding needs. Write for illustrated catalog and name of stocking representative in your area.

DETROIT STAMPING COMPANY
349 MIDLAND AVE. • DETROIT 3, MICH.



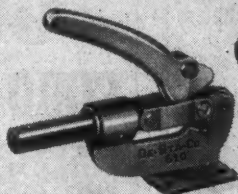
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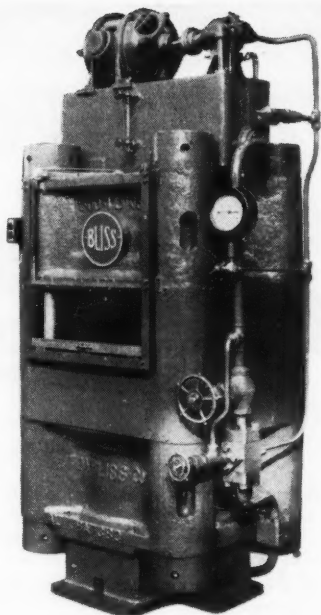
464



610

tended for use by manufacturers requiring a number of reproductions of certain dies for use in multiple stamping operations. These reproductions are obtained by forcing a master punch into metal blocks. The resulting cavities thus conform exactly to the contours of the master punch, it is claimed.

The Bliss 500-Ton Hydraulic Die Hobbing Press is completely self-contained. The frame consists essentially of two steel castings rigidly mounted on four heavy steel tie rods. Safety shields are provided for all openings to the die space. Control of the press is said to be easily



Bliss 500-Ton Hydraulic Die Hobbing Press

effected by means of manually-operated valves fitted with handwheels and conveniently located on the machine front.

Specifications of the press are as follows: capacity, 500 tons; stroke of slide, 6 inches; maximum vertical opening, 10 inches; minimum vertical opening, 4 inches; pressing speed, 2 inches per minute; distance between tie rods to clear, 16½ inches front to back x 21½ inches right to left; overall height, 100 inches; and projected floor space, 32 inches front to back x 36 inches right to left.

ADVANCE CLAMPS

Cut Set-Up Time 75 %

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JIGBORERS

THE ONLY T-SLOT CLAMP

For use on all machines with T-slots.

Manufactured and sold by

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Interchangeable heads for engraving, electrical marking, and acid etching . . . available for all models. Also Panto engraving cutters, cutter grinders, master copy type, endless belts and accessories.



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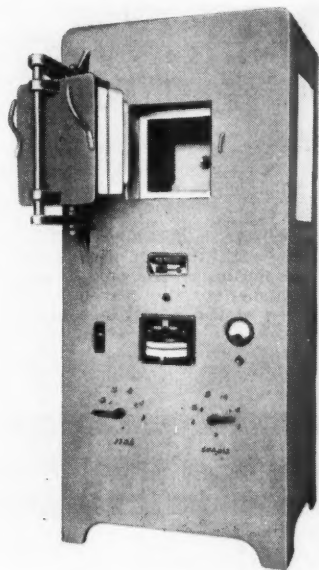
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Wooster Pike Cincinnati, Ohio

Pereco LB-74 Electric Laboratory Kiln

Designated as the Pereco LB-74, an electric laboratory kiln of complete-unit design, with all controls and operating mechanism contained in a single compact housing, is now being marketed by the Pereny Equipment Co., 893 Chambers Rd., Columbus 8, Ohio. Of semi-muffle construction, the kiln is said to offer ex-

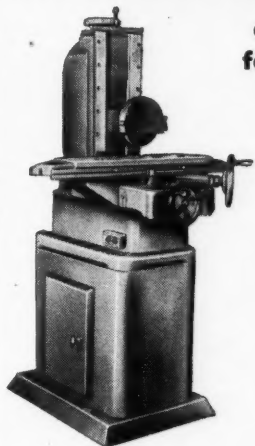


Pereco LB-74 Electric Laboratory Kiln

treme flexibility of firing cycle, ranging from drying temperatures up to 2,700 deg. F. within two hours for continuous operation ("flash" firings up to 3,000 deg. F.). The heat is said to be evenly distributed from eight Globar elements (four each over and under the chamber) baffled for maximum temperature uniformity.

Additional features of the Pereco LB-74 Electric Laboratory Kiln include a fully automatic, electronically-operated indicating and controlling pyrometer; current input meter with push-button control that is claimed to provide accurate visual control over current input for identical repeat firings; and multi-tap (36 taps) auto-transformer which is said to permit close control of power input and provide for long life of the elements. All controls

EXCEL Model No. 7 SURFACE GRINDER



a new hand
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the low-
priced field

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Bench Model
(less motor)

F.O.B.
Benton Harbor,
Michigan

A machine designed specifically for grinding tools, dies and other tool room work. Its extra heavy construction makes it suitable also for many production jobs. Operation is simple — controls are conveniently located. **Sealed-for-Life**, ball bearing mounted spindle, hardened spiral pinion and rack, and ground cross-feed screw are your guarantee of fine finishes, smooth table operation and long, accurate machine life. Furnished in bench or floor models.

Working Surface $5\frac{3}{8}'' \times 10\frac{3}{8}''$
Longitudinal Table Travel 12"
Transverse Table Travel $6\frac{1}{8}''$
Capacity Under 7" Wheel 9"
Net Wt. Floor Model 825 lbs.

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MM-98

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COVEL MANUFACTURING CO
BENTON HARBOR • MICHIGAN

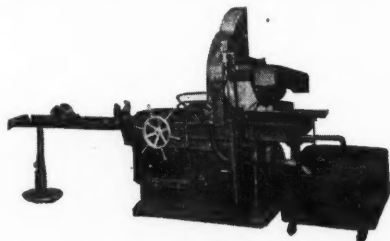
and instruments of the unit are arranged on the front panel for at-a-glance readings and for quick adjustments. To prevent burns, the full wall-thick door pivots on a deep hinge, with the hot surface always away from the operator. A circuit breaker cut-off switch is said to automatically protect the kiln from overloading. A safety pilot light warns of any interruption to kiln operation.

The lightweight 7½-inch super-refractory insulation of the LB-74 is claimed to reduce heat radiation loss to a minimum. Mesh guards at the back and sides of the unit are easily removable to allow for immediate access to the heating elements and working parts. Of completely welded, heavy steel, reinforced construction, the kiln, which measures 24¼ inches deep x 29¼ inches wide x 64 inches high, is designed for operation on 230 volts, 60-cycle single-phase a.c., and has a 9 kw. input at maximum, with variable control from 1.8 to 9 kilowatts.

Cutamatic Model 460 Wet Abrasive Cutting Machine

Designated as the Cutamatic Model 460, a semi-automatic wet abrasive cutting machine consisting of an oscillating

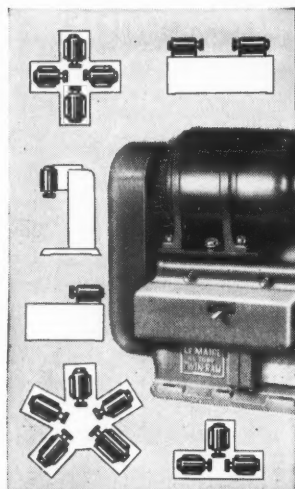
swing frame, a work feeding and holding mechanism, a coolant system, and a hydraulic work clamping and wheel feed unit has been announced by the Campbell Machine Division, American Chain and Cable Co., Inc., Bridgeport 2, Conn.



Cutamatic Model 460 Wet Abrasive Cutting Machine

In operation, the abrasive wheel is automatically fed through the work and, upon completion of the cut, is automatically returned to the starting position. The return of the wheel is controlled in such a manner as to compensate for wheel wear.

The handwheel operated feed carriage



**A POWER UNIT THAT PROVIDES
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TWIN RAM

- for drilling, boring, reaming, etc.
- vertically, horizontally, or at any angle
- in single or multiple arrangements
- can be transferred from one base to another

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Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-it Gear Chucks.

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THREADWELL TAP AND DIE COMPANY

Makers of Threadwell Taps, Dies, Counterbores, Twist Drills, Keyway
Broaches, Self-Oiling Pipe Threaders and other fine cutting tools.

incorporated in the design of the unit also acts as a length gage bar for cut-off pieces and, in addition, serves as an ejector for the cut-off parts. The bar being cut is firmly clamped on both sides of the cut-off wheel while the cut is being made. A hydraulic gripper incorporated in the feed carriage is timed with the clamps at the wheels so that the work bar is firmly held by one or the other at all times.

The Cutamatic Model 460 Wet Abrasive Cutting Machine is said to cut up to 6-inch diameter solid stock or any shape that can be contained in a 6-inch circle.



SOUTH BEND

Universal Tool Block

Replaces tool post and nine standard tool holders. Rigidly supports turning, boring, threading, and cut-off tool bits. Rotatable. Has self-aligning knurling head. Precision adjustment for tool height. No re-adjustment required when replacing tools. Adaptable to some other lathes. Write for dimension sheet.

Lathe Size	9"	10"	13"	14 1/2"	16"	16 3/4"
Price	\$11.25	11.75	13.75	15.75	16.25	

427A E. Madison St. South Bend 22, Ind.

SOUTH BEND LATHE WORKS

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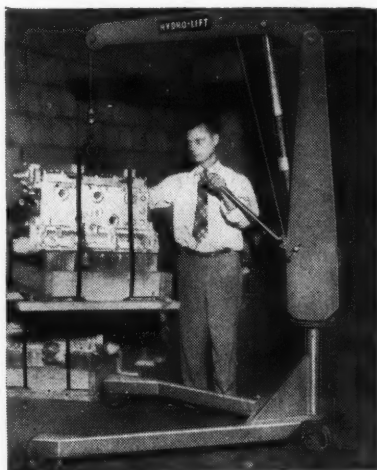
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If additional files are desired add \$1.75 for each file and holder. BE SURE TO FURNISH DIAMETER OF DRILL PRESS SPINDLE GULL FULLY GUARANTEED.

If Your Local Dealer cannot furnish the VERSATACH Write Directly to THE SENEWA COMPANY, Dept. D, P.O. Box 1111, Hutchinson, Kansas

"Hydro-Lift" Portable Shop Crane

A portable shop crane to be known as the "Hydro-Lift" is announced by the Cardinal Corp., St. Paul, Minn. The




"Hydro-Lift" Portable Shop Crane

crane, which has a 2,000-lb. capacity, is said to be ideal for use in machine shops, garages, industrial plants, and foundries. The 45-inch boom with which the crane is equipped is also said to make it useful in the easy installation of equipment or in moving shop equipment. If a greater boom length is desired, an 18-inch extension arm may be attached. A special locator pin provides for locking of the boom in the proper working position.

The design of the Hydro-Lift Portable Shop Crane includes a double-acting hydraulic pump which is said to convert

Save Time With RADIUS DRESSER

Thousands of Somerset Dressers in service. Offer outstanding features—Wheel is dressed from below, avoids removal of guard. Stop pins permit rotation thru 180° or 90° either direction. Wearere bearing is dustproof.

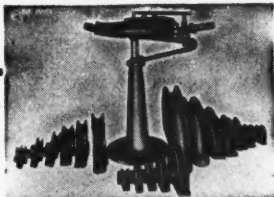


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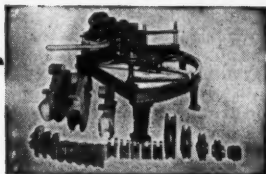
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320 Virginia St. Hillside, N. J.



**BY HAND or MOTOR
MACHINES TO BEND COLD PIPE, CONDUIT, BOILER TUBING
AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE**



Above: Hand-powered Type A-30 . . . up to 180° bends . . . all sizes from $\frac{1}{8}$ " to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" x 18" floor space!



Above: Motor-powered Type E . . . bends fixed radii of 6 to 1 up to 90°. Type E bends $2\frac{1}{2}$ ", 3", $3\frac{1}{2}$ " and 4" pipe. 3 horse-power motor. Floor space occupied—7' 6" x 7' 6". Other power machines up to 8" capacity.

Other Sizes Available

**Factory and Main Office: 14 Furnace St.,
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**"American"
PIPE BENDING MACHINE
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YOUR "SPECIAL BUSHINGS"

May Be Our Regular
STOCK ITEMS!



Accurate
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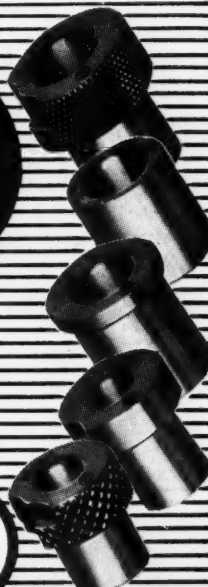
TWO complete bushing standards, the A.S.A. Standard plus our own Acme Standard, enables you to obtain bushings from stock that might otherwise require special manufacture. Results in faster delivery, lower cost. Write for catalog.

Acme Industrial Company

Makers of Hardened and Ground Precision Parts

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THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS



every movement of the pump handle into lift motion, thus enabling the heaviest loads to be raised quickly and easily. Neoprene oil seals are provided which are claimed to resist corrosion, eliminate leakage, and provide for the holding of the load at any desired height.

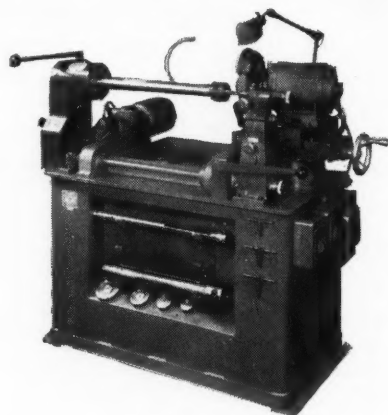
Fabricated of formed steel, the frame of the unit provides a stable platform for heavy loads. Three rubber-tired roller bearing wheels permit loads to be moved quickly and easily. Placement of the towing handle in an upright position automatically sets a brake which prevents the crane from moving when lowering or hoisting loads.

Hybco Model 1500 Tapper Tap Grinder

To meet the demand for a machine for accurately sharpening the chamfers of 90 and 180-deg. precision hook tapper taps, Henry P. Boggis & Co., 1279 W. Third St., Cleveland 13, Ohio, has brought out the Hybco Model 1500 Tapper Tap Grinder illustrated herewith.

The machine is designed for grinding 90-deg. bent or 180-deg. precision hook taps from $\frac{3}{16}$ to $1\frac{1}{4}$ inches and straight

shank tapper taps from $\frac{3}{16}$ to $2\frac{1}{2}$ inches. Change gears are available for 3, 4, 5, 6,



Hybco Model 1500 Tapper Tap Grinder

or 8-flute taps, right or left-hand thread. The length of chamfer and amount of relief are variable.

USE WILLEY'S DIAMOND DRESSERS

With WILLEY'S METAL SETTINGS and NATURAL WHOLE DIAMONDS



Willey's Diamond Dressers can be adapted to all makes of grinders, for rough, semi-finish and finished dressing, for grinding hardened parts requiring a precision ground finish.

A trial will convince you there is no wheel dressing tool on the market, costing two or three times the price, that will equal its performance and cost per dressing.

WRITE FOR CATALOG 42 — Illustrates complete line of Willey's Diamond Tools and Mechanical Dressers.

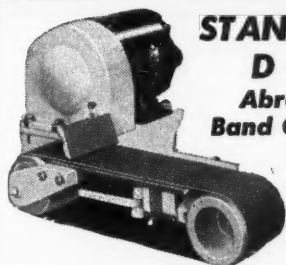
No.	Usable Contents of the Diamonds		QUANTITY PRICES				Wheel Diameter
	Diameter	Length	1-25	26-50	51-75	76-100	
W-3	$\frac{5}{16}$	$\frac{5}{16}$	\$11.00	\$10.00	\$ 9.00	\$ 8.00	6 to 12
W-4	$\frac{11}{32}$	$\frac{3}{8}$	13.00	12.00	11.00	10.00	12 to 20
W-5	$\frac{3}{8}$	$\frac{13}{32}$	15.00	14.00	13.00	12.00	20 to 24
W-6	$\frac{7}{16}$	$\frac{7}{16}$	17.00	16.00	15.00	14.00	24 to 42

WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan



STANDARD D - 4 Abrasive Band Grinder

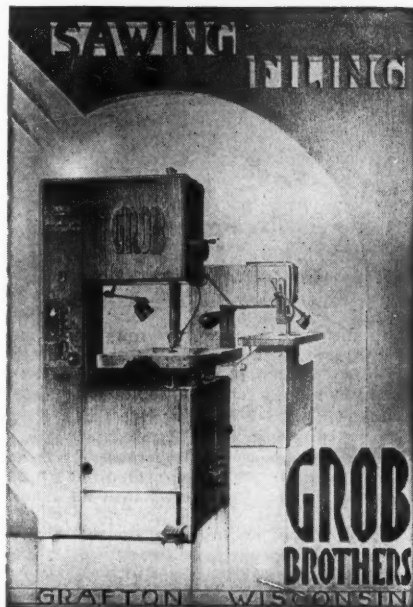
Famous
for
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x36 1/4" band. The ideal portable unit.

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MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP.

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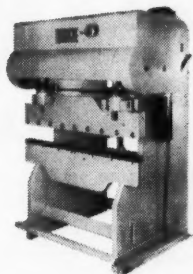


Built like a rock but **EASY** on the budget

●KNIGHT Press Brakes' features include heavy welded construction, generous bearings, all controls located in front. Micrometer dial permits adjustments to .001". Visible extreme ram position indicators. Many features found only on expensive machines . . . built into these low-cost press brakes designed to relieve your larger, more expensive equipment.

KNIGHT PRESS BRAKES

Available in four sizes: 24, 36, 48 and 60-inch capacities. Equipped with Link Belt anti-friction bearings, Cutler-Hammer controls, Reeves variable pitch pulley drives, Westinghouse motors, Twin Disc clutches. Designed also to facilitate quick and easy repairs and replacements.



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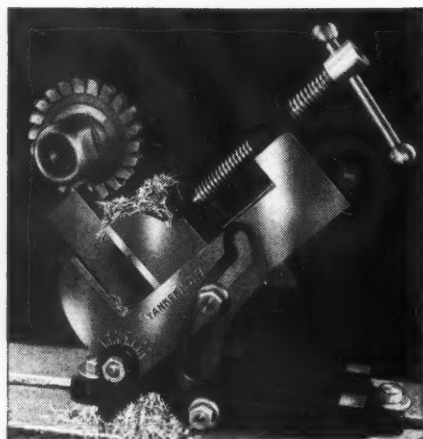


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"YANKEE" ANGLE VISES

A jig-type set-up in jig time. Lock the work in the "Yankee" Angle Vise. Tilt for any angle and engage positive adjustment lock. That's all... for every operation, hand or machine. Quick release swivel base for bench use. Attaches easily to machine face plates. Two sizes... 2" and 2 3/4" jaw widths... with or without swivel base. Order from your industrial distributor. Write us for vise folder and "Yankee" Tool Book.

YANKEE TOOLS
NOW PART OF



THE TOOL BOX
OF THE WORLD

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

Sieco Indexing Turntable

An indexing turntable for induction soldering, brazing, or heat treating is now being marketed under the trade name of Sieco by the Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J. With the unit, workpieces are placed either manually or automatically on work holders and all operations thereafter are electrically and air controlled. As many as 12 work stations



Sieco Indexing Turntable

can be provided on the standard turntable top. Holding jigs to accommodate special workpiece shapes are available from the manufacturer or may be added by the user. The formed metal cabinet is of heavy gauge steel and is finished in machinery gray crackle. Leg room is provided for the operator's comfort.

The Sieco Indexing Turntable is provided with a heating time range of from 1 to 60 seconds which is controlled by an adjustable electric timer. Limit switches and electric air valves are said to ensure the proper sequence of operation. An air pressure regulator, oiler, and filter are standard equipment of the unit. Modified forms of the standard turntable are available. These include non-indexing turn-

FLYNN OFFSET BORING HEADS



Micrometer offset screw ground from solid.

Large, easy to read dial graduated in .001"

Tool block hardened, ground and fitted to body.

"V" tool block holds any size bar rigid.

Interchangeable shanks and arbors.

USED FOR 30 YEARS IN TOOL ROOMS AND PRODUCTION SHOPS FOR PRECISION BORING

Head No.	Body Dia.	Maximum Bar Capacity	Micra Offset	Price
6	1 1/2"	3/4"	1/4"	\$ 22.
8	3 1/4"	3/4"	1/2"	30.
10	4"	3/4"	1/2"	70.
12	4"	3/4"	1"	45.
20	7 1/2"	1 1/2"	1"	125.
30	4"	3/4"	1 1/2"	70.
32	5 1/4"	1"	2"	115.
35	4 1/4"	3/4"	1 1/2"	85.
36	6 1/4"	1 1/4"	2"	150.

FLYNN MANUFACTURING CO.
137 BATES STREET • DETROIT 26 MICHIGAN

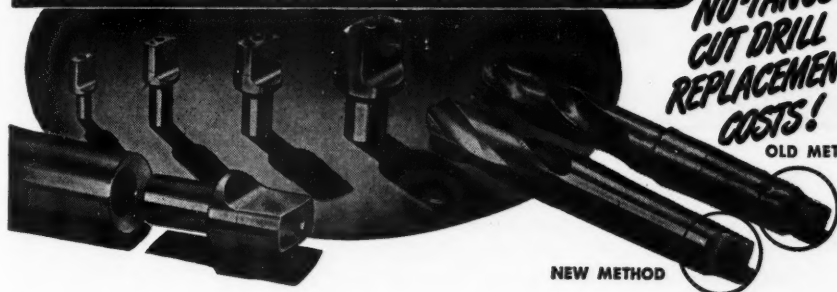
BAUMBACH THE DIE SET AUTHORITY



All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

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NEW DRILLS FROM OLD WITH NU-TANGS



NU-TANGS CUT DRILL REPLACEMENT COSTS!

OLD METHOD

NEW METHOD

Send us your old drills—we'll make them new again at a fraction of the cost of a new drill! Exclusive NU-TANG* process replaces twisted or broken tangs with brand new tangs of correct size—and with GUARANTEED ORIGINAL STRENGTH. No welding—No distortion—No shortening of drills—No sleeves.

Any drill, reamer, or other tool with a Morse taper in sizes 2 to 6 can be repaired perfectly this quick new way. Delivery—One week. Used by many leading industrial plants. Amazingly low cost—satisfaction guaranteed! Send for complete information *Patent Pending.

NU-TANGS INC. 1337 Bates Street Cincinnati 25, Ohio

write today

table for continuous travel of workpieces through tunnel type coils and also jet quench attachments for hardening applications.

The Sieco Indexing Turntable is designed for use with a 60-lb. air supply and 220-volt 60-cycle single-phase power. The accompanying illustration shows the unit in use with Sieco 2 kw. induction heater. The turntable may also be used directly with Sieco heaters of 5, 10, and 15 kw. output. When used with the Sieco 1 kw. bench mounted induction heater, special attachments for the smaller heater are provided.

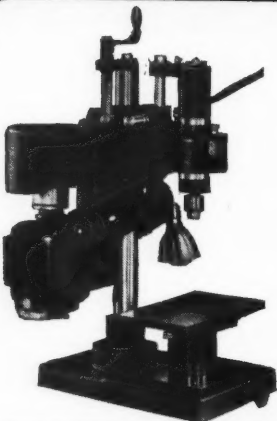
Snyder Special-Purpose Machine Tool

A special-purpose machine tool which is designed to perform drilling, counter-drilling, chamfering, tapping, and reaming operations on automotive crankshafts and to maintain accurate relationship of the holes thus produced has been built by the Snyder Tool & Engineering Co., Detroit, Mich. The design of the machine includes two slide units having 18 inches of feeding stroke and operating on hardened and ground ways. Tools are supported in multiple spindle heads which

are powered by a 10 h.p. and 7½ h.p. motor. A Geneva indexed 6-station trunnion fixture mounted between the heads is powered by a 2 h.p. motor. Five stations are working positions and one is for loading and unloading purposes. The work-holding fixtures are easily accessible through both an opening in the housing at the loading position and a large opening in the rear of the machine.

In operation, the stem end of the crank is drilled, counterdrilled, reamed, and tapped. The flange end has six flange holes which are drilled and chamfered and three holes which are drilled, chamfered, and reamed. The large center locating hole in the flange is drilled to depth in two passes and then combination counterbored and reamed. The drills are operated at a speed of 60 surface feet per minute, the reamers at 40 feet per minute, and the tap at 30 feet per minute. The tapping operation is performed

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IN *all* DRILLABLE MATERIALS

If your job is to drill small, precision holes in hostile material try the Hamilton Varimatic Drill. It's super-sensitive; and the speed is infinitely variable between 840 and 9300 R.P.M. Clearances and travel are ample for all work of medium size. 80% of present installations are repeat orders. The reason for this popularity is built into the machine. Our Bulletin V-47 "tells all". Write for it!



THE
Hamilton

TOOL COMPANY

SUPER SENSITIVE DRILLING MACHINES
TAPPING MACHINES PORTALATORS

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Foolproof Air Control

Norgren Lubro-Control Units automatically clean, control and lubricate air power . . . boost performance, cut wear and reduce maintenance in air driven tools and cylinders.

Compact, streamlined assembly of filter, regulator and lubricator, easy to install in any air line.

- **filter** stops all solids and eliminates moisture and oil emulsion.

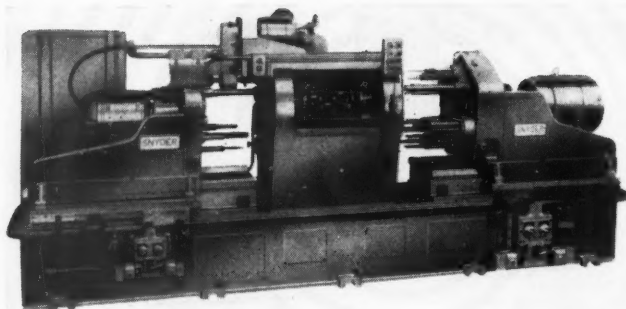
- **regulator** accurately controls air power for smoother performance with less secondary pressure drop than conventional regulators.

- **lubricator** oils the air that drives the tool. Protects against wear while tool operates; against rust and corrosion while tool is idle.

Write for Catalog 400 • **C. A. NORGREN CO.**
222 Santa Fe Drive

Denver 9, Colorado

Norgren



Snyder Special - Purpose Machine Tool

units at the rear of the machines supply coolant for the drills and reamers and oil for the tapping operation. Another tank unit houses hydraulic oil control valves and motor-driven hydraulic pumps.

tion is performed by a lead screw tapping unit mounted on the trunnion housing proper. The tapping spindle drive is mounted in ball bearings; however, the spindle drive proper is carried by the lead screw nut to assure the proper tap lead. All other spindles are mounted in ball bearings and are made of alloy steel. All tools are mounted in standard adjustable holders.

The unit has a production rate of 65 machine cycles an hour at 80 per cent efficiency and occupies a floor space of 60 x 170 inches. Two coolant pump and tank

Federal Dial Feed Press

A dial feed press designed to perform numerous secondary operations, such as redrawing, piercing, stamping, broaching, wiring, punching, burring, and so on, on blanks or shells which have been previously blanked and drawn is now being manufactured by the Federal Press Co., Elkhart, Ind. The press may also be used for many assembling, riveting, and closing operations on finished parts and on material other than metal.

The Federal Dial Feed Press may be



HARDNESS TESTER

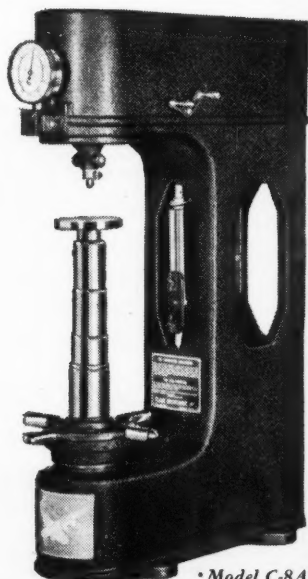
Better Engineered for **Better "Rockwell" Testing**

For your "Rockwell" testing, you want an instrument that gives you results of unquestioned accuracy. Years of research have gone into making the CLARK Hardness Tester just such a precision instrument.

The CLARK gives you accurate results for every production requirement. It is durably built to give you years of dependable service. It is fast and simple to operate; easy to maintain. Compare the CLARK and see for yourself how much more it has to offer.

CLARK INSTRUMENT, INC.

10200 Ford Road • Dearborn, Michigan



• Model C-8A
\$450.00 F.O.B. Detroit
Complete with diamond penetrator

**SOUTH
BEND**

TURRET TOOL BLOCK

Square turret indexes within .0005".
Rocker adjustments provided for tools.
Mounts on cross slide. Fits current model
South Bend Lathes, adaptable to
others. Write for dimension sheet.



HOLDS
4 TOOLS

Size Lathe	Size Sq.	Tools Tools	Price \$	Price \$
9"	3"	1/2" x 1/2"	\$40	\$45
10"	3"	1/2" x 1/2"	40	45
13"	3"	1/2" x 1/2"	—	50
14 1/2"	4"	1/2" x 1/2"	—	70
16"	4"	1/2" x 1/2"	70	75

Double Tool Cross Slide Model

Compound Rest Cross Slide Model

PAT.
PEND.

SOUTH BEND LATHE WORKS 427A E. Madison St.
South Bend 22, Ind.

High Speed Cutting Tools

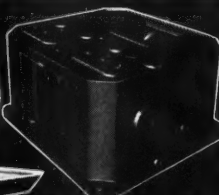
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flat form and special tool bits. • Design
and manufacture of small machines, jigs,
gages and experimental parts. • Regrind-
ing and salvaging high speed flat form,
special bits and small flat broaches.

Write for quotes.

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3304 Dix Road Lincoln Park, Mich.

*bases
... any size
any shape*



LITTLEFORD

fabricates 'em



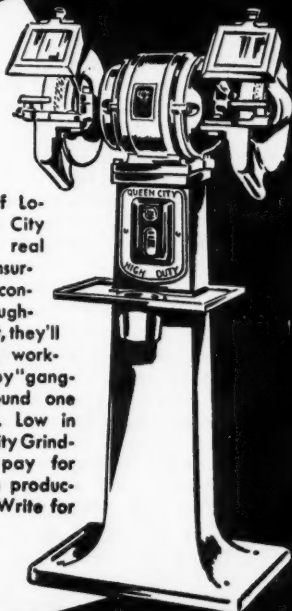
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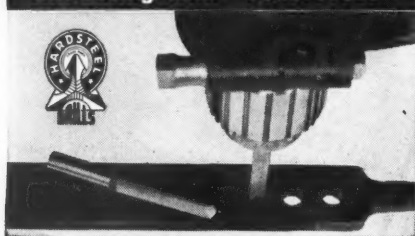


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Drill Hardened Steels without Annealing with "HARDSTEEL"



Don't let anyone tell you that hardened steels must be annealed before drilling, countersinking, counterboring or reaming.

With "HARDSTEEL" drills you can produce accurate, smooth holes in steels hardened by any process—oil-hardened, water hardened, cyanided, nitrided, and they work equally well on work-hardening steels and high carbon-high chrome steels of any degree of hardness.

"HARDSTEEL" drills used with standard drill presses cut costs in production shops because parts drilled after hardening always match at assembly. In service shops they save time and material and permit engineering changes calling for additional drilling to be made after parts are full hardened.

Write for a copy of the "HARDSTEEL" Operators Manual showing how "HARDSTEEL" drills are now functioning in thousands of plants in parts recovery operations.

You Harden It — We'll Drill It — with "HARDSTEEL"

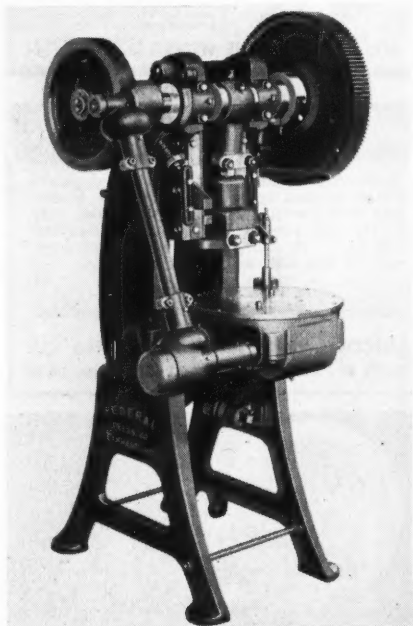
"HARDSTEEL" Tool bits make faster, deeper cuts on steels and non-ferrous alloys.

BLACK DRILL CO., Division Black Industries
1372 East 222nd Street + Cleveland 17, Ohio

"HARDSTEEL"

DRILLS • TOOL BITS • SPECIALS

set to perform several operations in sequence. In a typical press installation, the operator places shells in bushings or on posts at the front of the dial. From this point they are carried around into accurate alignment with the punch or punches and then moved further on and either mechanically ejected, picked off, or dropped to the base. At 60 strokes per minute the operator, it is claimed, can usually handle 3,000 to 3,500 pieces per



Federal Dial Feed Press

hour. For fully automatic operation the press is sometimes arranged with a chute or hopper feeds to supply the shells to the dial stations. In addition, the machine may be fitted with roll feeds to handle the strip from which the shells are blanked and cupped preparatory to other operations on the dial.

According to the manufacturer, the Federal Dial Feed Press is accurately built so that each station in the dial lines up precisely with the center line of the slide, thereby eliminating the need for a locking device to stop and lock the dial. The table or dial is indexed by a cam and is always in positive control, it is stated. Each of the dial stations can be equipped

with a bushing, fixture, or die, according to the requirements of the job. All moving parts of the machine are fully enclosed.

Ohmstede Model SC-42 Shape Cutting Machine

To meet the demand of manufacturers for a cutting machine to handle large sizes of work, the Ohmstede Machine Works, 897 N. Main St., Beaumont, Tex., has brought out the Ohmstede Model SC-42 Shape Cutting Machine illustrated herewith, which is rigidly built and compactly constructed. The machine is supplied equipped with a production type base and, as a unit, can be readily moved to accommodate changes in production schedules for the most efficient organization of work.

The Model SC-42 can be quickly set up for cutting a few parts by simply using a templet made of plywood or, if production cutting is required, a steel templet can be quickly made by cutting such a templet from a plywood templet. Using magnetic tracing, the machine is said to cut an unlimited variety of shapes. Straight-line cutting is readily accom-

plished by running the tracer along a straight bar. This bar can be turned at any angle so that cuts can be made either longitudinal or across the plate.

The use of high strength aluminum alloy is said to make the machine stable and rigid under all conditions. Oversize anti-friction bearings are used in the aluminum alloy arms, the bearings being completely sealed from foreign material. The variable speed motor is of the totally-enclosed type so that no dust or other foreign material can reach its working parts, thereby assuring long life.

All controls of the machine for operation are centralized on a panel within easy reach of the operator. The speed of the motor can be varied by rheostats on the panel from 3 to 30 inches per minute. By using different sizes of tracing rollers, this range of speeds can either be decreased or increased. Torch controls are located within easy reach during the cutting operation. The handwheel for regulating the height of the torch above the work is handy for the operator, who has complete control of the machine at all times. Offsetting the torch from the line of cut is accomplished by turning the conveniently located handwheel in the direction the offset is desired. This offsetting enables the machine to produce cuts

OIL HARDENING
NON-DEFORMING

Warplis

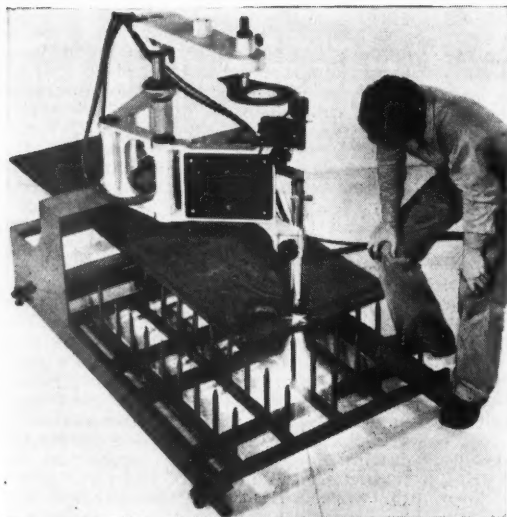
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●WARPLIS rods are accurate, truly round, highly polished pieces of top-quality oil hardening tool steel . . . readily machineable . . . free of surface decarb. For your fussy small tools and parts requiring plenty of hardness and toughness, with no appreciable warping or dimensional change.

Genuine WARPLIS oil hardening drill rods are obtainable from fine steel distributors and mill supply houses everywhere, same as our water hardening and high speed grades. Send for Pittsburgh's folder on drill rods.

PITTSBURGH TOOL STEEL WIRE CO.

MONACA - PENNA.



Ohmstede Model SC-42 Shape
Cutting Machine

Clearing Welding Press

The Clearing Machine Corp., 6499 W. 65th St., Chicago, Ill., has developed a spot welding press which is claimed to be capable of handling large complicated sections quickly and efficiently. The machine is said to perform the welding job in one step. Moreover, several welds can be produced at the same time, it is claimed.

Actuated by a toggle link mechanism, an "up" moving platen with four-point suspension brings the work to the electrodes. The welding operation is automatically controlled from a special panel. Each time the press reaches the top of the stroke, a contact on this control panel energizes the automatic welding panel. This panel then takes over and causes the actual welding process to be performed in the required sequence with the necessary timing while the press

that are unblemished by the piercing operation. The oxygen and acetylene supply is carried through hoses to a hose block at the rear of the machine.

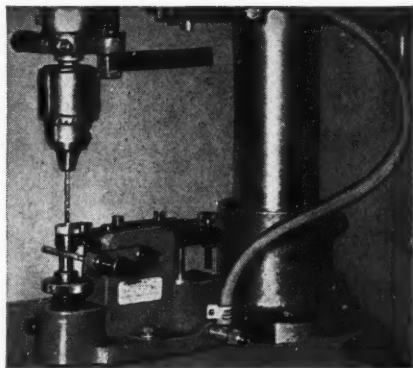
panel. This panel then takes over and causes the actual welding process to be performed in the required sequence with the necessary timing while the press

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DRILLING FIXTURE

• This Universal drilling fixture is rigid, sturdy and machined to exact tolerances. It will handle round stock 1/16" to 1" and by using a special upper beam or drill bushing carrier 1 1/2" can be received for cross drilling. Special drill bushing carrier can be supplied for multiple spindle drilling also for drills 5/16" to 15/32." This fixture can be mounted on any of the regular bench type or floor type drill presses in a matter of minutes. Depending on type of material and diameter of hole size, it will increase production from 33% to 200%.



Patent Pending

Send for literature giving complete description. Agents wanted.

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3139 ENYART AVE • CINCINNATI 9, OHIO

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DIFFICULTY CENTERING
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- Functions on any machine with cross-feed.
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Successors to The Benton Company
DEPT. M., COVINA, CALIFORNIA



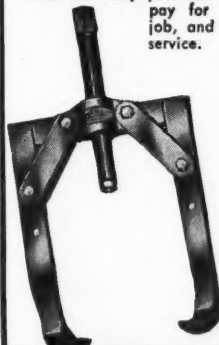
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12 types, 40 sizes (including special designs for special application) with Drop forged arms and heat treated forcing screws.

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CATALOG Contains latest data, sizes and prices.

WRITE: Wendt-Sonis Company, Hannibal, Missouri; 580 North Prairie Ave., Hawthorne, Calif.; 1361 West Lake St., Chicago, Ill. Warehousing Facilities: Eastern Carbide Corp., 909 Main St., New Rochelle, N. Y.



WENDT SONIS CARBIDE CUTTING TOOLS

Boring Tools • Centers • Counterbores • Spot-facers • Cut-Off Tools • Drills • End Mills • Fly Cutters • Tool Bits • Milling Cutters • Reamers • Roller Turning Tools • Special Bits

dwells in a closed position. At the end of the welding operation, a contact on the welding panel transfers control back to the press control panel, which immediately allows the platen to return to its open position, completing the operational cycle.

Parallelism between the platen and the bed is obtained with four adjusting brackets, one located in each corner, and the platen is guided by four individual gibs which also are adjustable. The single geared V-belt drive with air friction clutch is located on top of the press.

While the basic principles remain the



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Most modern Nibblers for
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Box 596, Philadelphia, Pa.



Clearing Welding Press

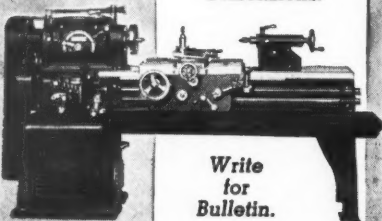
same, the Clearing Welding Press is built to suit individual jobs, according to specifications supplied by the user.

CARROLL AND JAMIESON LATHES

16"

12 Speed Geared
Head Motor Drive
Timken Mounted
Spindle.

Modern Design—
Liberal
Dimensions.



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**THE CARROLL & JAMIESON
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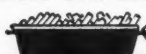
KATYIA OHIO U.S.A.

Lyon-Raymond Hydraulic Elevat- ing Work Positioning Platform

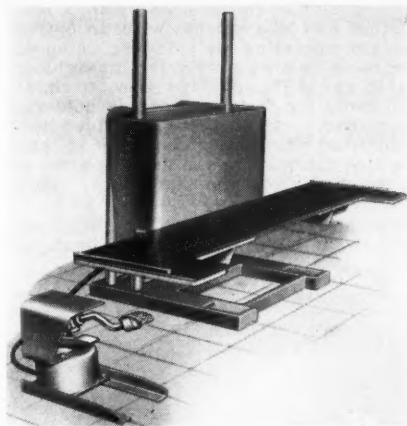
To facilitate the wiring of telephone switchboards, the Lyon-Raymond Corp., 5711 Madison St., Greene, N. Y., has developed a special hydraulic elevating platform which has capacity of 500 lb. and can be adjusted from a lowered height of 4 inches to an elevated height of 30 inches. This range of elevation is said to allow all work to be performed from a comfortable sitting position and is controlled by a hydraulic foot pump conveniently located near the operator.

New Nesting Type TOTE PANS

20" Long x 12"
Wide x 6 1/4" Deep
16 Ga., drag holes,
handles both ends.



J. L. LUCAS & SON, INC.
BRIDGEPORT 5, CONN.



Lyon-Raymond Hydraulic Elevating Work Positioning Platform

To protect the finished surfaces of the switchboards, the specially shaped platform is covered with plywood.

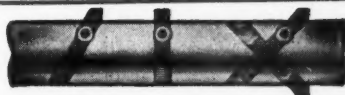
Safety features of the Lyon-Raymond Hydraulic Elevating Work Positioning

Platform include metal guards over the lifting mechanism and over the pump release pedal. A special valve is said to prevent the platform from dropping in the event of a break in the hydraulic system.

Progressive Improved Rocker Arm Welder

A standard air-operated rocker arm welder of improved design is now being offered in both 30 and 50 kva capacities and with throat depths ranging from 18 to 36 inches for each capacity by the Progressive Welder Co., 3050 E. Outer Dr., Detroit 12, Mich. The front part of the machine which accommodates the welding stresses is of heavy reinforced welded steel construction to provide strength where strength is needed. The rear part of the machine serves mainly as an enclosure and is provided with quickly removable panels to afford complete access to the entire interior of the welder.

Three independent water cooling circuits are provided for the transformer, lower arm, and upper arm of the machine. Sight gages show water circulation through an opening in the side of the unit, which features a larger range of



A BETTER BORING BAR

OUR fine list of Customers is PROOF that our method of broaching square holes makes a better fit for the tool bit. This means more rigidity and longer life especially with tungsten Carbide. We also make bars for our Type B and Type C cutters or a combination of tool bits and cutters. Bars are made to suit customers' requirements as to method of drive, pilot, number of holes, angle of bit, etc. Our two-bladed cutters can be floated in the bar or held rigidly. Cutters are interchangeable—hence can be ground in an arbor in the tool room and only require a few seconds for inserting in the bar. Square hole sizes range from $\frac{1}{8}$ " up to and including $\frac{3}{4}$ ".

THE DETROIT BORING BAR CO.
688 E. FORT ST. Detroit 26, Mich.

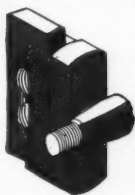
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1927

TYPE "B" AND "C" CUTTERS

Suitable for Tipping With Tungsten Carbide



"B" A strong rigid serrated 2-bladed cutter—located in the bar with a taper pin. Bores holes accurately to close limits. Can be expanded and reground giving long life. Sizes $\frac{1}{8}$ " dia. up to 6".



"C" A simple 2-bladed reaming cutter. Can be expanded and reground. Located in the bar by a hardened V. This V never has to be reground as blades are expanded.



Fits other bars with slots
 $\frac{3}{4}$ " x $\frac{1}{8}$ "
 $\frac{1}{2}$ " x $\frac{1}{8}$ "
 $\frac{3}{8}$ " x $\frac{1}{8}$ "
 $\frac{1}{4}$ " x $\frac{1}{8}$ "



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Although we have been building standard fractional H. P. motors for years, the majority of our production is taken by manufacturers whose basic product design or end-use requires special features. We are providing such service to many leading names in industry, and would be pleased to consult with you on your motor design problems.

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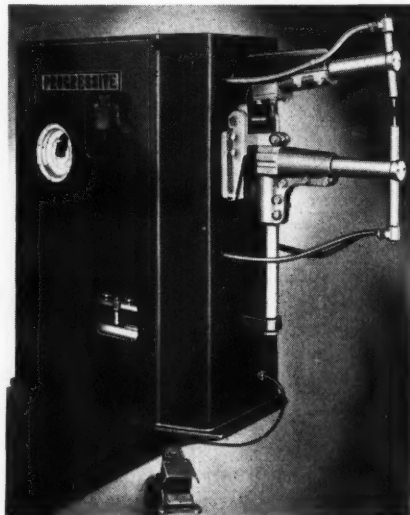
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MACHINES, INC.**

DOERR
MOTORS

From 1/20 to 2 H. P.
Standard or Designed
to Your Specifications

adjustment of throat opening than heretofore and is available with an optional single operating cylinder or compound retractable stroke cylinder, interchangeable within the machine. Greater rigidity of mounting for the electrode holders in the arms is claimed to be provided in the improved unit, the transformer of which is direct coupled to the welding arms and supported from the rigid front column of the machine.

Additional features of the Progressive Improved Rocker Arm Welder include a



Progressive Improved Rocker Arm Welder

compact air line accessory group mounted within the machine but visible through an opening in the side panel; externally accessible heat control; self-lubricating bearings and other features to virtually eliminate all maintenance other than supplying air line lubrication as required; high speed air valve which permits the use of unusually high welding speeds; water and air systems which are completely piped to the rear of the machine to facilitate installation and maintenance; greater in and out adjustment of the welding arms to provide a wider range of utility, particularly with offset electrodes, and so on; and group mounting of all controls except the foot switch. The entire right side of the machine is clear to allow for the side mounting of electrical controls if desired.

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NICHOLSON VALVES

Are the Equal of Any Other Cylinder Control

And 10 times out of 10 we believe Nicholson can furnish a standard or special valve to fill your need. This combination of dependable service and completeness of line is a logical reason for the increasing standardization on Nicholson valves.

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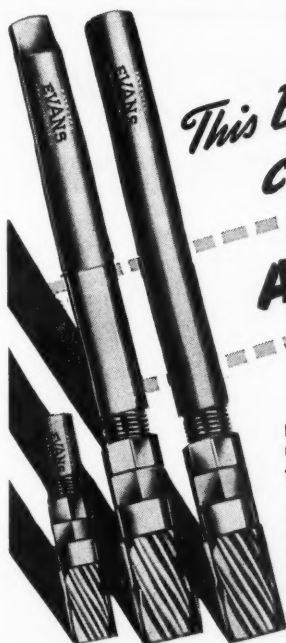
You can economize on spare parts as well as cut "down time" by their trouble-proof features. Metal combinations for specific needs. CATALOG 546.

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136 Oregon St., Wilkes-Barre, Pa.



Manual, foot, solenoid, motor types for all mediums. Pressures to 5000 lbs.

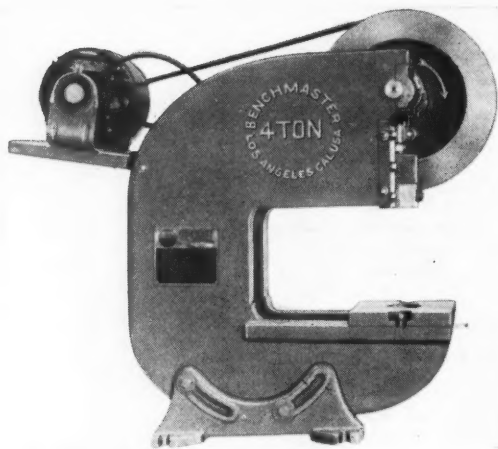


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**REAMER AND
MACHINE CO.**
New Lexington, Ohio



Benchmaster Deep Throat Punch Press

The Benchmaster Manufacturing Co., 2952 W. Pico Blvd., Los Angeles 6, Calif., announces that the throat depth of its standard 4-ton punch press has been in-

Benchmaster Deep Throat Punch Press

creased to permit punching to the center of a 17½-inch circle, thus making the press particularly useful for sheet metal work, as well as other jobs requiring a punch press with a deep horizontal throat. Adequate power is said to be provided for most jobs by a ½ h.p. motor.

The frame size and weight of the machine have been considerably increased and webs added between the frame sides for extra reinforcement. The press, which may be used either with or without the 6 x 8 x 1-inch bolster plate, is offered with a choice of 1 or 1½-inch stroke, although strokes up to 2 inches may be obtained on special order. The ram position is adjustable, the dovetails are gibbed for take-up if wear occurs. All bearings are bronze bushed. A positive single trip safety mechanism is employed to engage the flywheel.

The Benchmaster Deep Throat Punch

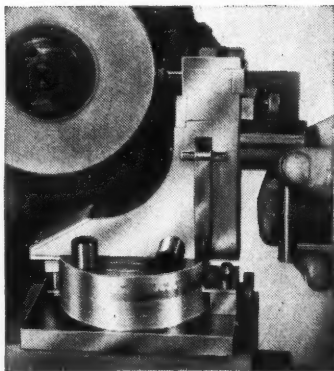
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Simplest and most accurate method of FORM-DRESSING!

• "Fluidmotion" Wheel Dressers generate wheel profiles in such a way that angles and radii flow into each other, without sharp changes of direction. Two angles and a radius can be dressed in one continuous motion—after only one setting of the dresser. "Fluidmotion" Dressers are made of the finest chromium-molybdenum-vanadium alloy steels and have no wearing surfaces, as the gibs and V ways are positioning surfaces only and the dresser swivels on completely dust-protected ball bearings. Several models available. Model F, illustrated, is the smallest. 5" height to diamond center, dresses wheels up to 7" in diameter, profile radius up to 2". Write for booklet.

* Reg. U. S. Pat. Off.

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Representatives in Principal Cities





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& MFG. CO.**

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FOR MORE TOOL MILEAGE



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7"

High Leverage
Diagonal Pliers

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Special Low Head
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The dependable B-Right-On Socket Screw Products line includes Hollow Set Screws and Pipe Plugs, Socket Head Cap Screws and Stripper Bolts.

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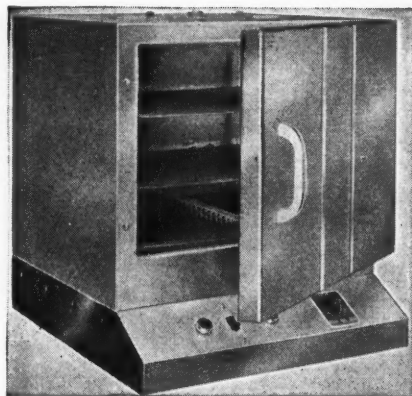
THE BRIGHTON SCREW & MFG. CO.

READING RD. AT DORCHESTER CINCINNATI 2, OHIO

Press may be supplied either in a bench or pedestal model with inclinable frame positioning. Sturdy cast iron legs are available as standard extras.

"Modern" OV-18S Electric Oven

Said to be ideal for annealing high carbon and high chrome tool steels, as well as non-deforming die steels, a streamline electric oven of all-polished stainless steel construction, identified as the OV-18S, is now being manufactured by the Modern Electric Laboratory, 6133 S.



"Modern" OV-18S Electric Oven

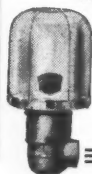
Wentworth Ave., Chicago 21, Ill. The outside housing, door, and base of the oven are made of No. 4 finish Armco stainless steel (Type 302, 18-8). The inside working chamber is made of No. 2 finish Armco stainless steel (Type 302, 18-8). The two adjustable wire shelves are made of stainless steel wire.

All six sides of the oven are insulated with a 2-inch layer of Thermo-O-Flake basic bonded block. The sensitive, powerful, hydraulic electric thermostat included in the oven design is fully approved by the Underwriters' Laboratory and by the Hydro Electric Commission of Canada, and has an accuracy of plus or minus 5 deg. F., the manufacturer states. The thermostat incorporates totally enclosed fine silver contacts.

The heating element of the oven consists of heavy Nichrome resistance wire spread over the entire base of the inside chamber to assure temperature uniformity. The fully insulated oven door is hung

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Increase Production

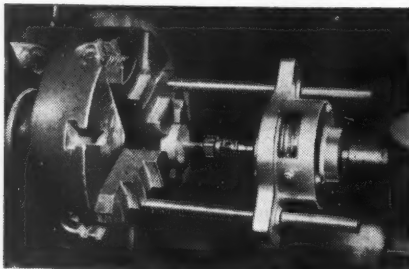


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- END BEARING FAILURES
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- MODERNIZE EQUIPMENT

Many Styles and Sizes
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Milwaukee Wisconsin

Here's How: TO TAP—and back out— WITHOUT STOPPING THE WORK OR REVERSING THE MACHINE



The Errington Auto-Reverse Turret Lathe Tapping Head is a new tool, practical, time-saving, money-saving. In a turret lathe setup, as illustrated, it allows you to tap the hole and back out the tap without stopping the work or reversing the machine. It's easy to operate: you simply feed the tap into, and out of, the drilled hole while the work is turning in the one direction. Can also be used on drill press work for production-tapping.

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Established 1891

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Gages to A G D Standards. Plug and Ring Gages. Adjustable Limit Snap Gages 0.0 to 24". Pneumatic Hammers. Centerless Lapping Machines. Special Plug, Ring and Snap Gages. Contract Grinding, Lapping, Superfinishing.

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STRAIGHT RODS

1/32" to 1/2" Diameter

Diam. Tol. .0005" on Rods Up to 6' Long.

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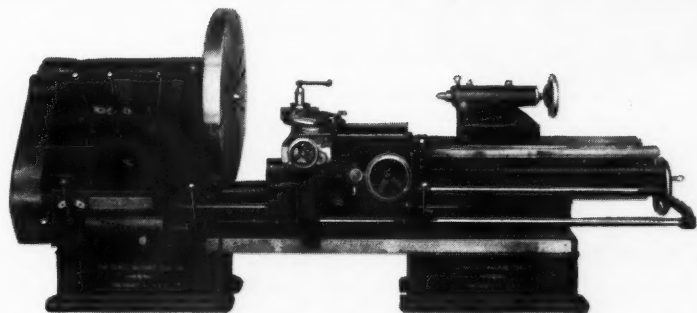
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High Quality**

**14 YEARS OF COMPLETE
CENTERLESS SERVICE**

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GRINDING CO.**

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Extension Bed Gap Lathes



Illustrated is the Series "AG" 20/40" Extension Bed Gap Lathe. Also made in 28/50" Heavy Duty.

The Extension Bed Gap Lathe is designed to be used either as a gap lathe or an engine lathe.

We also manufacture a line of regular geared head engine lathes.

Write for circulars.

The Nebel Machine Tool Co.

on a continuous hinge. The latch is designed to ensure safety in the event of sudden internal pressure. Two intake ports are located at the bottom of the unit and two exhaust ports with stainless steel slides are located on top of the unit.

Specifications of the "Modern" OV-18S Electric Oven are as follows: inside dimensions, 18 $\frac{3}{4}$ inches wide x 14 $\frac{1}{4}$ inches high x 17 $\frac{1}{4}$ inches deep; outside dimensions, 22 $\frac{1}{4}$ inches wide x 24 $\frac{1}{2}$ inches high x 24 inches deep; current consumption, 1,750 watts; voltage, 115-volt single phase a.c. or 220-volt single phase a.c.; temperature range, 100 to 550 deg. F. (38 to 282 deg. C.); thermostat response sensi-

tivity, $\pm \frac{1}{2}$ deg. C.; net weight, 110 lb.; and shipping weight, 160 pounds.

Dayton Rogers HPT Hydro-Pneumatic Overload Pitman

According to the Dayton Rogers Manufacturing Co., 2824 S. 13th Ave., Minneapolis 7, Minn., the HPT Hydropneumatic Overload Pitman which is now being offered by this firm is so designed that the linkage can be arranged to protect any given power press tonnage, or the hydro-mechanism can be adjusted to

protect any given set of press tools.

The unit is so constructed that when any overloading occurs during the work cycle, the pitman, which carries the ram of the press, retreats the required amount against a high pressure hydraulic cylinder, allowing the overload linkage to shorten, thereby permitting the press to continue through its work cycle and providing the machine and the tools, including the work, the desired pressure and working protection. The re-setting and re-establishing of the fluid in the cylinder are obtained by a pneumatic pumping mechanism operated off the shop air line, thereby assuring constant hydraulic pressure on the piston, as well as constant working pressure at all times, it is claimed.

Said to assure definite protection against all crank and press frame breakage which would otherwise be caused by the over-

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Compact—built low so operator's foot can rest on floor—treadle action is soft and stroke very short

—well shielded against dirt—guarded against accidental trip—properly balanced so cannot tip over—can be bolted if desired—can be easily serviced without disturbing piping. Supplied with or without secondary latch treadle. Send for full data.

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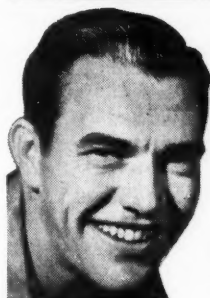
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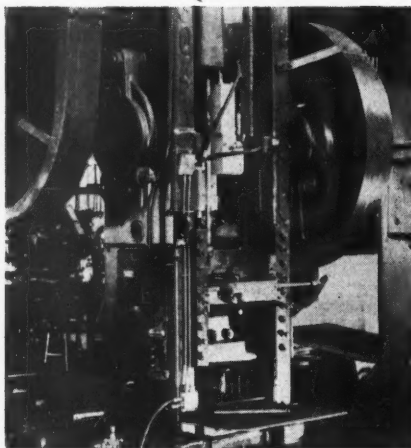
The DAHLSTROM TAP GUIDE virtually eliminates tap breakage—and saves those costly hours spent prying broken taps out of dies. Saves time, too. Just a few turns of the handle and the job is done. Winds through continuously, with no back-off. Work is always dependably straight and square.

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Dahlstrom TAP GUIDE





Dayton Rogers HPT Hydropneumatic Overload Pitman Installed on a Power Press

loading or jamming of the power press, the HPT Hydropneumatic Overload Pitman is manufactured in sizes from 55 tons up to fit all presses.

Robertson Resin-Bonded Grinding Wheels

To complement its line of vitrified-bonded grinding wheels, the Robertson Manufacturing Co., Trenton 5, N. J., is now marketing a line of resin-bonded grinding wheels on which printed matter is available providing grinding recommendations for all types of material. Where requirements are not met by standard recommendations, the company offers a complete engineering service to fill the grinding requirements of any potential grinding wheel user.

Leslie Model A Blanking Press

A blanking press which has no ram, ways, or slides yet is claimed to possess the accuracy of a leader pin die set is announced by the Leslie Welding Co., Dept. SS, 2943 Carroll Ave., Chicago 12, Ill. Of all steel and welded construction, the press, which is designated as the Model A, is said to be especially adapted to blanking operations on sheets of any type material.

In the press, positive die alignment is maintained by the aligning leaf assembly, to one end of which the punch is fas-

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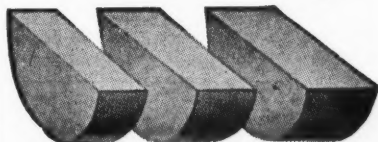
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MODEL JA
50,000 R. P. M.

\$42⁰⁰

IN U. S. A.



Weight 12 ounces;
length 6 3/4 inches;
chuck size 1/8 inch.
Wheel guard re-
moved for better
illustration.

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tened. The other end of the aligning assembly is attached to the press frame by means of a flat spring serving as a pivot when the punch is raised and lowered. Due to the rigidity of the leaf assembly, except at its flexing point, and the crank-shaft construction that applies pressure to the leaf at two widely separated points, as in a double crank press, the load on the punch plate need not be centered, it is stated.

Designed to accommodate most blanking punches ordinarily used in small power presses, the punch plate measures $\frac{1}{2}$ inches front to back and $4\frac{1}{2}$ inches



All standard sizes carried in stock for immediate delivery. Special cutters made to Blue Print.

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QUALITY TOOL WORKS

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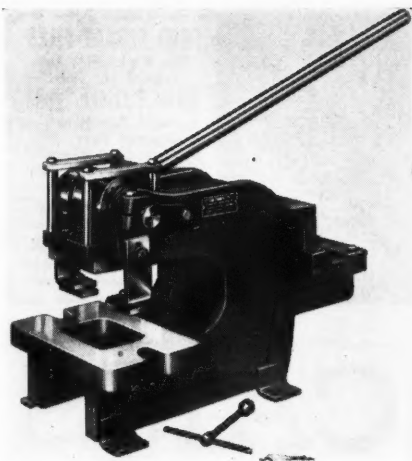
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11

The EAST SHORE MACHINE PRODUCTS CO.

835 EAST 140th STREET • CLEVELAND 16, OHIO



Leslie Model A Blanking Press

right to left. The press has a throat depth of 6 inches and a stroke of $\frac{7}{16}$ inch, with adjustment of $\frac{1}{8}$ inch. The die space (stroke down, adjustment up) is $4\frac{1}{4}$ inches. The hole in the press bed measures $3\frac{1}{2}$ inches front to back and $4\frac{1}{2}$ inches right to left. The press has a capacity for producing a 3-inch diameter hole through 16 gauge mild steel or a 2-inch diameter hole through 12 gauge mild steel. The capacity can be readily exceeded by employing a pipe extension on the press handle.

"Bob-Cat" Electric Hoists

The Lisbon Hoist & Crane Co., Division of The Wright File Co., Lisbon, Ohio, announces the expansion of its line of "Bob-Cat" electric hoisting equipment to



M-D Facing Heads With Automatic Feed

Can be attached to Boring Mill Bar, and Drilling or Milling Machine spindles. Single point tool travels radially, from center outward or reverse; feeds automatically. Sizes 6" to 46" diameter.

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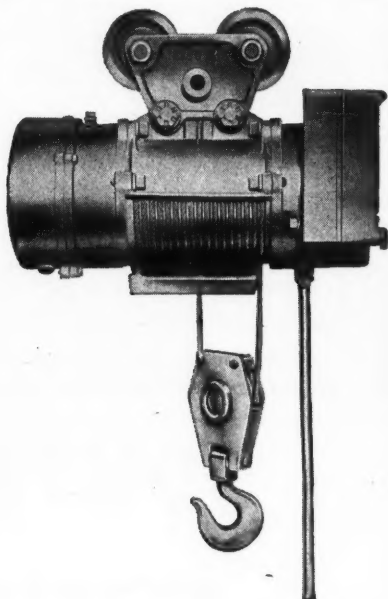
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TROYKE MFG. CO.

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include additional models and new 3 and 5-ton capacity electric hoists. The new models are claimed to feature unusually lightweight and small overall dimensions due to an arrangement whereby the motor of each hoist is mounted on the inside of the cable drum.

Made in three sections, thus permitting complete and easy access to any part by the removal of but four bolts,



"Bob-Cat" Electric Hoist

each of the new model hoists is said to have a safety factor of six to one or better. The hoists are made entirely of steel forgings and castings and are equipped throughout with ball bearings. Gears are made of heat-treated alloy steel.

Wilson "Wasp Special" Arc Welding Machine

The Air Reduction Sales Co., Dept. A1777P, 60 E. 42nd St., New York 17, N. Y., announces the availability of the Wilson "Wasp Special," an air-cooled engine-driven arc welding machine which is designed to furnish a smooth steady

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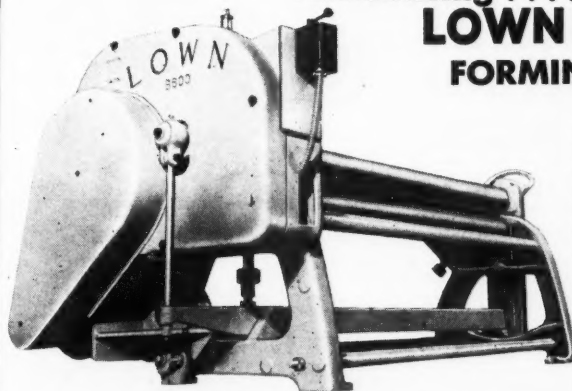
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Model B-600 Series—6" diameter

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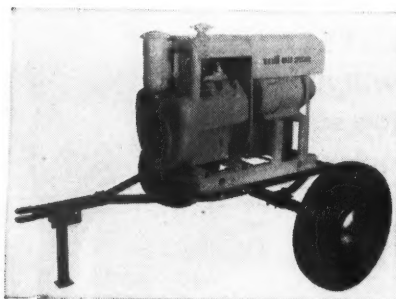
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current and to stand up under unusual and regular duty factor load conditions in difficult construction and maintenance jobs in many varied applications.

The 200-ampere welder has a welding



Wilson "Wasp Special" Arc Welding Machine

range of 25 to 250 amperes at 30 volts, 50 per cent duty cycle. According to the manufacturer, it is a lightweight machine that is easy to handle and ideal for work in places inaccessible to larger and heavier equipment. Two convenient outlets

are provided which may be used for lighting purposes or to operate universal power tools in an emergency.

Hydro-Solv "A" Sludge and Gum Solvent

Known as Hydro-Solv "A," a sludge and gum solvent which, it is claimed, can be added to regular hydraulic oils to remedy any sluggish operation caused by contaminants has been developed by the Swan-Finch Oil Corp., RCA Bldg., West, 30 Rockefeller Plaza, New York 20, N. Y. After the recommended 100-150 working hours allowed for the treatment, it is recommended that the system be completely drained and filled with new oil. Gum and sludge, either in solution or suspension, are said to be removed with the dirty oil. The necessity of cleaning the system after using the solvent is claimed to be eliminated.

Hydro-Solv "A" is a liquid concentrate composed of several highly active organic gum and sludge solvents. According to the manufacturer, these compounds have been specially selected to perform specific functions when added to a used oil in a contaminated system, with the final

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PATENT ADJUSTABLE HOLLOW MILLING TOOL

Quickly and easily adjusted — rugged in construction — rigidly locked when on the job.

Carbide tipped blades optional, are quickly interchanged with the high speed steel blades, for cutting the harder or gritty materials.

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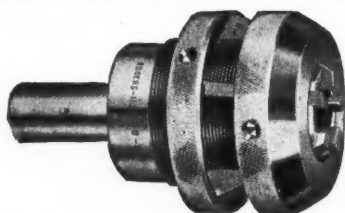


Fig. 20—Shank Integral

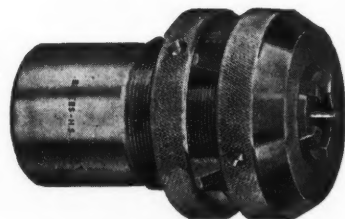


Fig. 23—Arbor Separate

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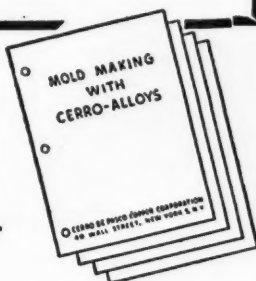
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product being a delicate balance and blend of each organic chemical having high compatibility and stability. The product is non-corrosive and will not affect fine surface finishes, it is stated.

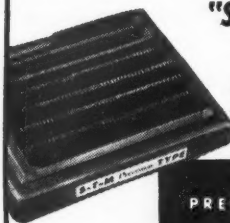
MGC Motor Generator Set for Magnetic Chucks

A motor generator set especially designed for operating the magnetic chucks of vertical spindle and rotary surface grinders has been brought out by the Mo-



MGC Motor Generator Set for Magnetic Chucks

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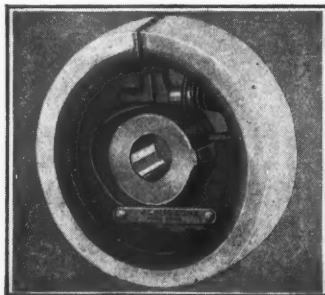
158 East Carson Street • Pittsburgh 19, Pa.

tor Generator Corp., Troy, Ohio. The set is available in generator capacities ranging from 500 through 25,000 watts, d.c. The size of generator required depends upon the size of magnetic chuck and whether it is of the circular or rectangular flat type, and whether multiple chucks are to be operated from one generator.

Famco Power Squaring Shear

The Famco Machine Co., 1324 Racine St., Racine, Wis., has introduced a power squaring shear of lightweight design which is said to be capable of cutting 18 gauge stock easily and rapidly. The machine is available in three models of 36, 42, and 52 inches, their respective shipping weights with motor being 1,050, 1,200 and 1,400 pounds.

Designed to conserve equipment and reduce upkeep in departments and shops doing light work, the Famco Power



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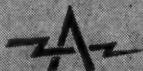
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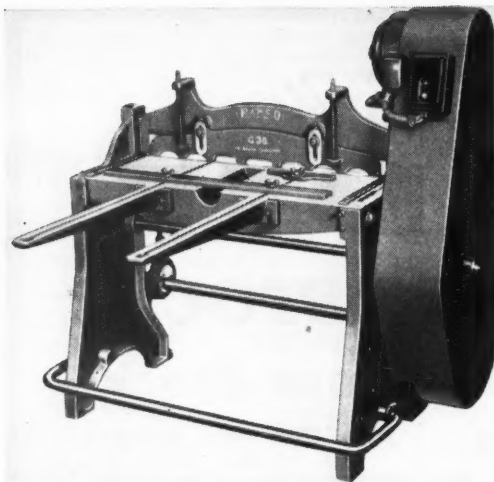


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Famco Power Squaring Shear

justable front and back gauges, holddowns, and guards. The shear has a special single stroke mechanism which can be easily set for continuous operation.

Squaring Shear is sturdily built throughout and equipped with a powerful gear drive. Inlaid, precision-ground, high carbon tool steel blades are regularly furnished as standard equipment, as are ad-

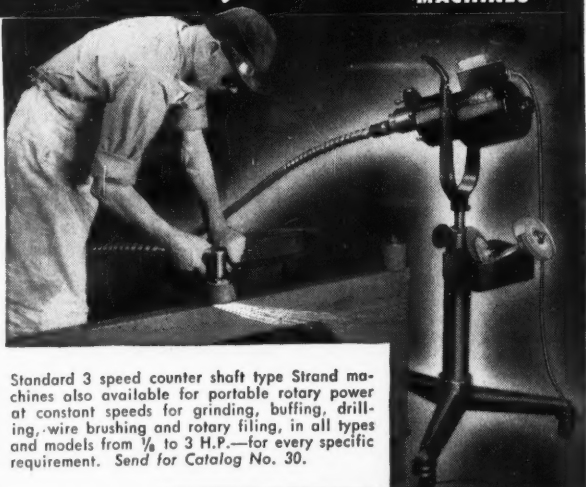
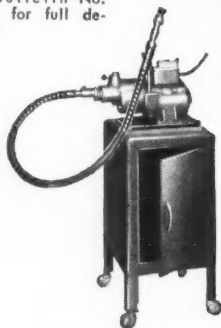
Farrell Four-Wheel Metal-Working Band Saw

Designed for the precision high speed cutting of metals, wood, plastics, and similar materials, a band saw of four-wheel design is now being produced by the T. Farrell Machine Co., 2834 San Pablo Ave., Berkeley 2, Calif. An unusual throat depth is said to be provided by the four-wheel design.

The cutting capacity of the saw is 27 x 12½ inches. The 18 x 24-inch table can be tilted 45 deg. right or 10 deg. left. An auxiliary table 16 x 18 inches in size is furnished. The four wheels are 12 inches

NEW 4-SPEED Strandflex FLEXIBLE SHAFT MACHINES

The Strandflex 4-Speed gear drive employs a patented, new type of quick change gear drive utilizing 4 POSITIVE speeds by a unique and easy method of instantly changing from one speed to another. Powered with totally enclosed ball-bearing motors (having speeds from 850 to 9000 R.P.M., depending on motor) means years of smooth, trouble-free service. Send for Bulletin No. 43-A for full details.



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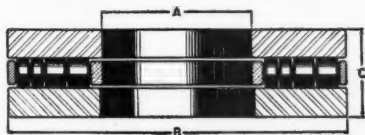


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G WILLIAM



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1/16" to 1/4" size figures.

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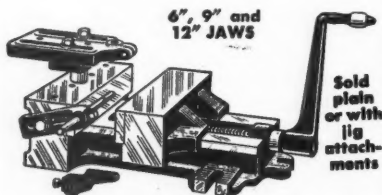
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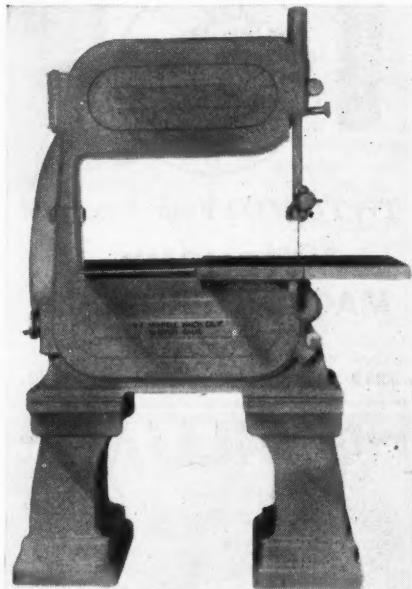
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Graham Mfg. Co.

37 Bridge St. East Greenwich, R. I.

in diameter, and the machine is intended for use with blades 10 feet 4 inches in length and from 1/8 to 1 inch in width.

The Farrell Four-Wheel Metal-Working Band Saw is provided with blade speeds of 550, 1,050, 1,750, and 2,700 f.p.m. A low-speed model is available with gear drive, providing a range of speeds starting at 65 f.p.m. Sealed factory-lubricated anti-friction bearings are used through-



Farrell Four-Wheel Metal-Working Band Saw

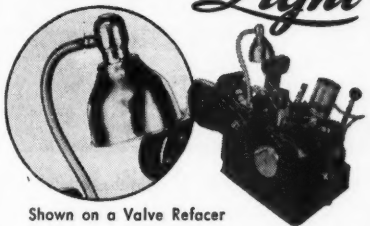
out the machine. The base and table castings are of gray iron, and the guard castings are of aluminum. Sealed ball-bearing saw guides are furnished.

Palmer Vertical Milling Attachment

The development of a vertical milling attachment which can be quickly applied to all makes of bench lathes has been developed by Palmer Industries, Inc., 6149 S. Sangamon St., Chicago 21, Ill. To apply the attachment, the lathe compound is removed and a vise, furnished as standard equipment, is installed in its

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CAN SEE THEM . . . USE

VIMCO
Light



Shown on a Valve Refacer

Made by S & D Engineering Co., Glendale, Calif.
Powerful direct light on any work area.
Flexible arm, ball-swivel joint, deep-well
reflector, safety wired. Easily attached,—
cost reasonable. Used by hundreds of machine
tool mfrs. for accurate results. Many
models described in Folder No. 74. Write.

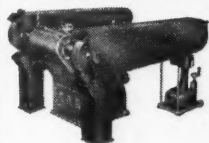
VIMCO MFG. CO.

111 Brayton St., Buffalo 13, N. Y.

Hammond
of KALAMAZOO
1908 MICHIGAN
**FINISHING PRODUCTION
REACHES A NEW PEAK**

**HAMMOND
BACKSTANDS**

CONVERT GRINDERS and POLISHERS
into high production
ABRASIVE BELT UNITS



Above: "VRO" Polishing
Lathe with two
No. 3 Backstands.



MODEL No. 3

**WRITE FOR
CATALOG NO. 55**

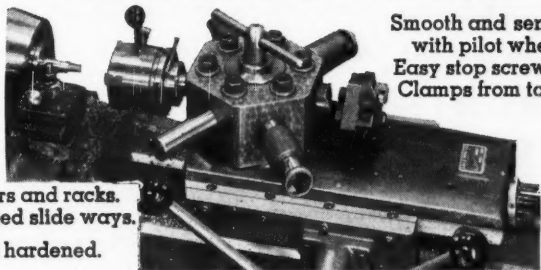
—covering complete line
of Hammond equipment.

Hammond Machinery Builders
1615 DOUGLAS AVENUE, KALAMAZOO 54, MICH.

DO TURRET LATHE JOBS

on your 9" to 16" engine and bench lathes with ENCO Self Indexing Hexturrets.

Typical
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Job.
Note die-
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box tool.



Smooth and sensitive control
with pilot wheel adjustment.
Easy stop screw adjustment.
Clamps from top of ways.

Write for
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and quotation
giving make
of lathe
and size.

Double gibs.
Double drive gears and racks.
Ground and spotted slide ways.
All working parts hardened.

Model 425
1" tool holes
4 1/4" stroke
Price \$275.00

Model 651
1" tool holes
6 1/4" stroke
Price \$350.00

Model 650
1 1/4" tool holes
6 1/2" stroke
\$400.00 to \$500.00

Model 425 available for Atlas, Logan, Clausing, South Bend 9"
and 10", Sheldon 10", 11" and 12", Craftsman 12", Powr Kraft
10" and Sebastian 12".
Delivery 2 weeks.

Model 651 for all above lathes except South Bend 9".

Delivery 2 weeks.

Model 650 for South Bend 13", 14 1/2" and 16", Regal 13", 15" and
17" and Sebastian 14" and 16".

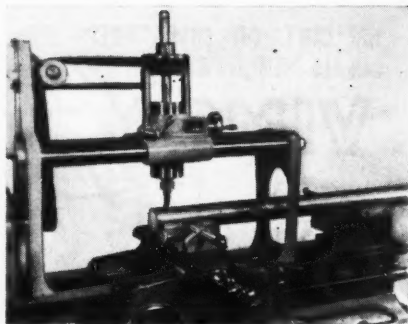
Delivery 2 to 6 weeks

ENCO MANUFACTURING COMPANY
Dept. 19 4522-24 W. Fullerton Ave., Chicago 39, Ill.

Also Mfrs of Enco Turret
Tool Posts For All Lathes

place. The milling attachment is then set on the ways, to which it is clamped firmly from underneath. Adapters are provided for each make of lathe.

The Palmer Vertical Milling Attachment is driven by the lathe spindle through a V-belt and adjustable pulleys. The longitudinal feed and cross feed of the lathe are used the same as on a milling machine. The milling attachment is said to provide for a cut 8 inches long on the longitudinal feed and half of the distance of the cross feed, and is designed to accommodate stock up to 3 inches in diameter under the cutter. End mills up



Palmer Vertical Milling Attachment Installed on a Lathe

to 1 inch can be used and, in some cases, 2½-inch circular cutters can be employed. Surface grinding can be accomplished using an inverted cup wheel. Keyway cutting operations can also be performed with the attachment.

WATCH FOR IT October "FREEDOM" Issue of MODERN MACHINE SHOP

Stanley No. 266 Bench Grinder

Stanley Electric Tools, New Britain, Conn., is now introducing a bench grinder identified as the No. 266. Powered by a ¼ h.p., ball bearing, constant speed induction motor, the grinder is said to be ideal for garages or factories, for light grinding, sharpening tools, buffing, polishing, and wire brush work. Its many features include full ball bearing action, bearings enclosed against dirt and grit, safety type wide wheel guards, adjustable tool rests, and toggle type switch enclosed in a molded case located in the base of the grinder. The guards are ad-

Producers of SCREW MACHINE PRODUCTS to specifications

We know our equipment.

Can we assist in designing your screw machine products for adaptation to our equipment?

Automatics—2½" Rd. capacity. Turret Lathes—3" Rd. capacity. Castings and Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading and Tapping. May we quote?

SCREW MACHINE SPECIALTY CO.

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Pittsburgh 1, Pa.



CUTTERS

For Flat Bars
Rods • Angles
Wire Rope

MADE IN THREE SIZES:

The sturdiness and dependability of these cutters reflect our more than 50 years of experience.

T. H. LEWTHWAITE MACHINE CO.

317 EAST 47TH ST.

NEW YORK 17

A Real Spring Winder !

No. 1 Capacity 0 thru 3/32" wire \$1.50

No. 2 Capacity 0 thru 3/16" wire \$3.00

No. 3 Capacity 0 thru 5/16" wire \$5.00

Will earn its cost in one day. The Hjorth Perfection Spring Winder offers the ideal means of winding extension, compression, torsion, taper, double taper, or left hand springs. Try one in your shop. You'll like it and the price is reasonable.

HJORTH LATHE & TOOL CO.

10 BEACON STREET

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"OLIVER" 36-inch Metal Cutting BAND SAW

Has low speed geared head direct connected to lower wheel for cutting risers, gates, and sprues.

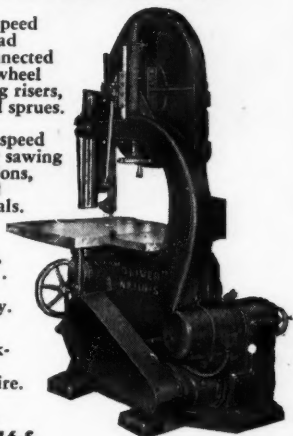
Has high speed motor for sawing compositions, wood and sheet metals.

Powerful, sturdy . . . cuts true and steady.

Has quick-change rim and tire.

Write for Bulletin 116-S.

Oliver Machinery Co., Grand Rapids 2, Mich.



◆ BLACK DIAMOND ◆ PRECISION GRINDER for ALL SMALL DRILLS

• No Mechanical Skill Needed To Grind Drills Accurately •



ANYONE can operate a Black Diamond. Even the most inexperienced can keep all small drills sharp—and true centered, with smooth lips accurately ground to exactly the same length—at the proper angle and with correct clearance for fast, precision drilling.

Black Diamond Grinders cut 50% and more on drill grinding costs, sharpen without waste of expensive drill stock, reduce drill breakage and work spoilage to a minimum.

The built-in Diamond Point Dresser keeps the grinding wheel ever-sharp and the Web Thinning Attachment cares for all types of Notched points to perfection.

Whether you use drills singly or in gangs—by hundreds or thousands—this moderately priced machine—motor driven—will keep any supply quickly available.

WRITE FOR NEW BULLETIN—TODAY.

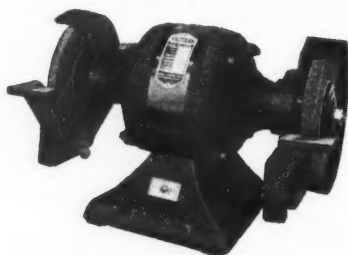
BLACK DIAMOND SAW & MACHINE WORKS, INC.

45 NORTH AVENUE

NATICK, MASSACHUSETTS

justable to permit grinding at any point on the circumference of each wheel.

The speed of the Stanley No. 266 Bench



Stanley No. 266 Bench Grinder

Grinder at 60 cycles is 3,450 r.p.m. The machine is furnished with two 6 x 2-inch wheels, one coarse and one fine.

Johnson's LW No. 20 Wax

A liquid wax for use as a lubricant in the manufacture of metal items by the impact extrusion process, to be known

as Johnson's LW No. 20 Wax, has been developed by S. C. Johnson & Son, Inc., Racine, Wis. Designed to withstand the great heat generated in the impact extrusion process and to afford complete freedom of flow, the wax, it is claimed, provides an even coating which remains in place under the high heat and does not dissipate itself.

Johnson's LW No. 20 Wax can be easily applied to slugs before extrusion by dipping or tumbling. It provides a dry finish, that is said to be easy to handle and sanitary.

Graymills Stock Oiling Unit

An automatic pressure feed stock oiling unit for punch presses has been announced by Graymills Corp., Evanston, Ill. The unit consists of a sturdy, compact force-feed lubricator and a portable pumping unit.

Lubricant is pumped into the oiler where it sprays both the top and bottom surfaces of the stock that passes through it. The excess oil is squeezed off (into the oiler) and drains back into the pump reservoir. A series of baffles in the reservoir settles out solids before the oil is recirculated. Inlets and drains are provided

PRENTISS



"Bull Dog" Machinists'

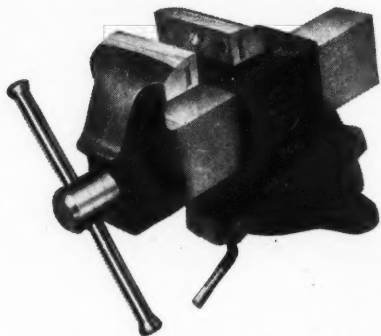
VISES

Backed by 80 years of time-proven acceptance by industry. Hundreds of plants have used them and still do. Insist on PRENTISS for that "Extra" Vise Service.

Your Industrial Distributor
can furnish.

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OF THE CHARLES PARKER CO.

**They Give
Service That Satisfies**



• **MERIDEN, CONN., U. S. A.**

Famous for

**THE TIME
THEY SAVE!**



The Ziegler Tool Holder saves a great deal of time when making set-ups for tapping and reaming jobs because the set-up does not have to be so accurately made, the holder automatically compensating for inaccuracies of as much as 1/32" radius or 1/16" diameter. Try it out and see for yourself!

W. M. ZIEGLER TOOL CO.

1928 Twelfth St., Detroit 16, Mich.

Ziegler
ROLLER
DRIVE

WRITE FOR
CATALOG

FLOATING HOLDER
for Taps and Reamers...

Micro
Supreme
**LAY-OUT AND
IDENTIFICATION DYE**

12 COLORS*

For Tool, Die, Pattern or Template layout on metal... Quick identification of stock and parts... Shows up in sharp relief—dies instantly—easily removed... Write for circular.

*Purple shipped unless otherwise specified

**MICHIGAN CHROME &
CHEMICAL COMPANY**

6340 E. Jefferson Ave. • Detroit 7, Mich.

**Why it pays to
specify**



CEMENTED CARBIDE



**Rough Bore and Face
Cast Iron Clutch Plates**

Pieces per grind TECO.....540
Best previous carbide.....240

Boring Stainless Steel

Valve Seat Rings
Pieces per grind TECO..... 35
Best previous carbide..... 5
*Many more on file.

THE above cases are not "one-time" records, but consistent averages tool after tool, month after month. TECO Cemented Carbide is not only far more productive than other carbides—but always uniform, lot after lot. Try TECO and be convinced! **AVAILABLE PROMPTLY** from tool fabricators and industrial distributors. Be sure to specify TECO on your prints and your orders.

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Put the
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to Work!

MOTO-TOOL No. 2 WITH EMERY POINT

\$16.50



Approx.
27,000
R.P.M.

DREMEL'S Improved Moto-Tool . . . the little electric grinder that does big jobs . . . can save you hours, by speeding up work now being done by hand. Invaluable for sharpening taps, drills, gauges, chisels, tools and cutters (without tearing down "set-ups"). Dremel Moto-Tool is a "war veteran" . . . used by all branches of the Armed Forces in far-flung repair bases . . . helped to set production records at General Electric, Westinghouse, Remington Arms, Ford, Nash-Kelvinator, Northrup, Douglas and other plants.

LOOK FOR THESE MOTO-TOOL FEATURES

- Housing has "pencil-type" finger tip • Instant-action, wrenchless chuck • Oil-less, sealed trouble-proof bearings
- Patented automatic chuck lock pin • Oversize armature shaft, hardened, ground and polished • 110 volt, universal type (AC-DC) motor • Easily replaced commutator brushes
- About 27,000 R.P.M.; cuts cleaner . . . saves cutters
- Sliding snap-type switch • Handy hanger hook • Cord protector • Sturdy, shockproof bakelite housing • Dust-filtered air-cooling system • Weighs only 13 oz. . . . shaped to fit the hand • Dynamically balanced for vibrationless operation.

MOTO-TOOL KIT No. 2



With 23
Accessories
\$23.50

PRE-WAR
PRICES
STILL
PREVAIL

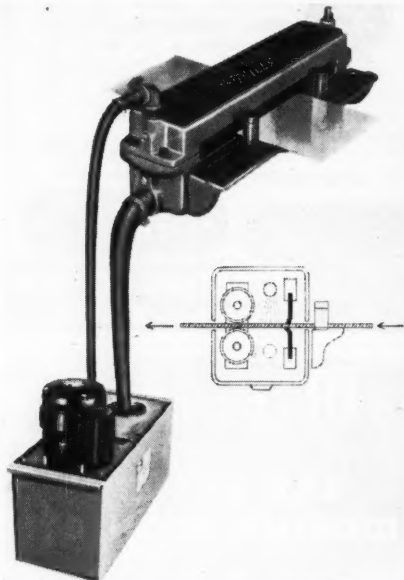
Moto-Tool Kit No. 2, with 23 accessories (high speed steel cutters, grinding wheels, polishing accessories) and heavy-duty professional Model 2 Moto-Tool in natural finish, hardwood case—**\$23.50**. (Items purchased separately would cost about \$30.00; you save \$6.50). Moto-Tool No. 2, with one emery point, **\$16.50**.

SEE YOUR MILL SUPPLY DEALER. IF HE DOES NOT
HANDLE MOTO-TOOL, WRITE THE FACTORY.

DREMEL MANUFACTURING CO.

at both ends of the oiler to allow for convenient installation. The two steel rollers with which the unit is provided are ball bearing mounted and held under spring tension. The oiler is made in three sizes to handle stock with maximum widths of 6, 12, and 24 inches. Maximum thicknesses up to $\frac{1}{4}$ inch can be accommodated by all three models.

The pumping unit is a $\frac{1}{4}$ h.p. driven gear type that is said to deliver up to 90 g.p.h., and is available with a 5 to 12-gallon container. The stock oiler can be



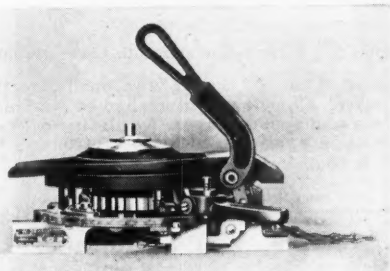
Graymills Stock Oiling Unit

obtained separately or complete with pumping unit, reservoir, and all necessary hoses and fittings as a package unit.

Rotor S-1 Scaling Hammer With Lever Throttle

Identified as the S-1, a scaling hammer with lever throttle for use in weld flux scaling, weld spatter removal, paint scaling, rust removal, and so on, is announced by The Rotor Tool Co., 17325 Euclid Ave., Cleveland 12, Ohio. The lever throttle permits the tool to be held and operated

AUTOMATIC CHUCKING AND INDEXING FIXTURE



- 1.—1800 light cuts per hour.
- 2.—Either horizontal or vertical position.
- 3.—Collets changed instantly.
- 4.—Automatically knocks piece out.
- Model D—Ratchet indexing only—1" cap.
- Model E—Both degree and ratchet indexing
—Capacity up to 1".
- Model F—Both degree and ratchet indexing
—Capacity up to 2 1/4".

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BUFFER SURFACER POLISHER



Polisher, buffer, surfacer and vertical or horizontal belt grinder, with centerless feed are all combined in the "PRODUCTION" TYPE S machine. Ideal for cylindrical polishing or straight line finishing on flat work. Can be used for anything that can be ground or polished—metals, rubber, fibre, wood, etc.

Write for Illustrated Folder

Production

MACHINE COMPANY GREENFIELD, MASSACHUSETTS, U.S.A.



You Need Only 1 DORMAN TAPPER

AUTOMATIC REVERSE

... instead of 3 ordinary tappers to tap
No. 2-56 to 2" in steel!

Plus additional advantages

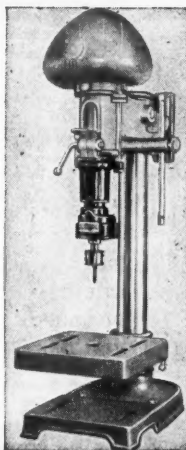
1. No Collets to get lost or need replacement.
2. Floating Chuck Jaw and Adjustable Friction Drive to prevent tap breakage.
3. No Pressure required to operate, makes a perfect thread (class 4 fit) possible.
4. Compact, Light Weight Aluminum Housing, occupies absolute minimum for tap capacity.
5. Furnished with Quill Clamp for rigidity or M. Taper Shank for quick change.
6. Low Price—No. 1 Size M. T. S. \$44.00.

2 LARGER SIZES — POSITIVE DRIVE

2-A Cap. 3/8" to 7/8" in Steel. 3-A Cap. 1/2" to 1 1/4" in Steel
4-A Cap. 1" to 2" in Steel incl. pipe taps

ALL UNITS EFFICIENT AS PRODUCTION THREADERS USING
ROUND SPLIT • BUTTON • ACORN DIES

Write for Bulletin



DORMAN MACHINE TOOL WORKS 36 S. Mac Questen Parkway, Mount Vernon, N. Y.

with one hand, thus providing maximum convenience for such operations as welding, where the operator holds the welding electrode in one hand, as well as reaching into recesses for rapid removal of weld flux scaling. The lever throttle is designed so that light pressure on the lever meters sufficient air for light work and heavier pressure affords full power for heavy duty work.

Other features of the tool, such as the exhaust air cleaning the work of chips and scale, chisel retainer with easy removal by thumb pressure, and the wafer valve of stainless steel, are the same as



Rotor S-1 Scaling Hammer with Lever Throttle

those of the S-1 Scaler with push throttle control. Chisels are furnished in blanks—flats and spoon shapes. A full line of star drills is available in sizes of from $\frac{1}{8}$ to $\frac{3}{4}$ inch.



steps

to HIGHER
PRODUCTION
and LOWER COSTS

1. Consult

the Milford
free engineering service



2. Choose

one of 15
basic Milford
rivet setting
machines —
offering
unlimited
versatility.



3. Select

exactly the right semi-
tubular or split
rivet or cold-
headed
fastener from
Milford's
complete line.



MILFORD

1000 MERWIN ROAD
MILFORD, CONN.

RIVET & MACHINE CO

1000 WEST RIVER ST.
ELYRIA, OHIO

Plomb No. 2135 Adjustable Bending Bar

Designated as the No. 2135, a bending bar featuring adjustable arms is now being introduced by the Plomb Tool Co., Los Angeles 54, Calif. The adjustable arms can be placed close together or far apart and may be positioned on the hexagon post so that the handle will project at the desired angle. More than 100 different positions of the arms are obtainable for bending, straightening, aligning, spreading, and forming various parts and materials. Ample leverage may be obtained with the 36-inch handle.

Automotive shop uses for the bending bar include straightening brackets, braces, frame members, tie rods, steering arms, bumper parts, body pillars, and door frames and hinges; aligning wheels, axles, and exhaust pipes; removing spring clips and sprung shafting;

FINISHED MACHINE RACKS



The Standard Steel Specialty Company, a pioneer in the machine rack field, has brought an accuracy and finish to this product that cannot be matched by any other company.

This rack is made from special machinery steel finished to our specification . . . cut by expert mechanics on machines designed especially for this work.

Send for our new catalog which gives information on Woodruff keys, taper pins, machine keys and features a chart for checking machine racks.

STANDARD STEEL SPECIALTY COMPANY

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PENNSYLVANIA

PLANTS: BEAVER FALLS, PA. • HAMMOND, IND.

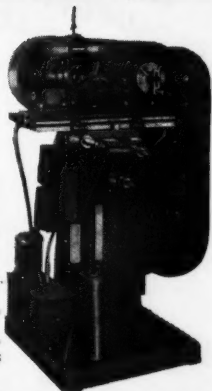
SAVE MONEY ON MILLING

UNITED STATES No. 1

FULL ANTI-
FRICTION
BEARING
HAND MILLING
MACHINE

Earns Its Keep
Many Times Over.

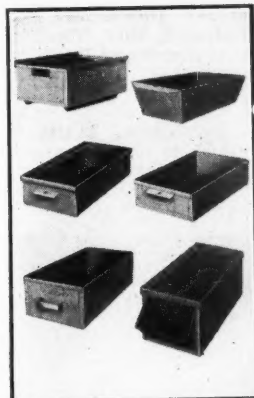
Ask your distributor
for full details
or write direct.



UNITED STATES MACHINE TOOL CO.

6 E. 72ND ST.

CINCINNATI 16, OHIO



Top Rim STEEL STACKING BOXES

18" x 12" x 6". 16 Ga.
with Drop Handles

STANDARD SIZES

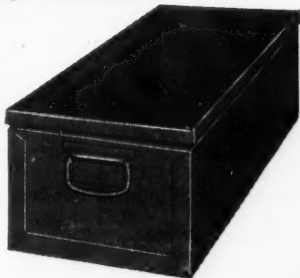
16 x 10 x 6 18 Ga.

16 x 10 x 6 16 Ga.

18 x 12 x 6 16 Ga.

18 x 12 x 8 16 Ga.

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WE MANUFACTURE ALL TYPES OF STEEL BOXES

We make a specialty of boxes made to fit your particular handling requirements. Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.

STERLING
FACTORY EQUIPMENT CO.

183 CHARLES ST.
PROVIDENCE, R. I.

**INCREASE HOLE
PRODUCTION WITHOUT
EXTRA MACHINES**



With Ettco-Emrick Multiple Spindle Heads mounted on your drill presses you get any required small parts drilling or tapping production at lowest tool and labor costs. Ettco Multiple Heads take up no additional floor space, yet—as many satisfied users have found—they make possible increases in output amounting to 100% or more. This is because they provide both the METHOD and the EQUIPMENT for drilling or tapping the maximum number of holes at every stroke of the press.

WRITE FOR BULLETIN NO. 31

It completely describes the Ettco-Emrick Multiple Head System and gives examples of the various methods used. Write for a copy today.

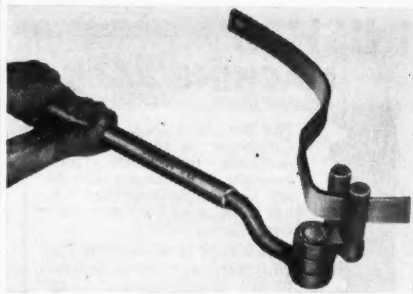


ETTCO TOOL CO.

598 Johnson Ave.

Boston, Massachusetts
Detroit, Michigan

• Brooklyn 6, N. Y.
• Portland, Connecticut
• Chicago, Illinois



Plomb No. 2135 Adjustable Bending Bar

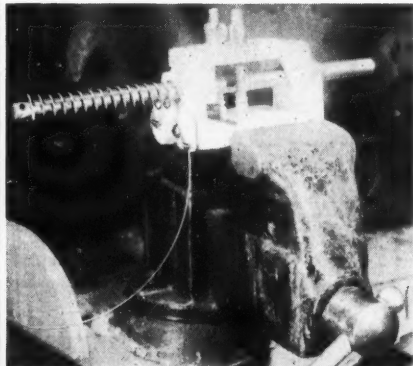
and spreading braces, brackets, and springs. It is also said to be useful as an auxiliary lifting and aligning device for heavy assemblies. Industrial uses for the unit include forming, straightening, and assembling on many different types of jobs.

J-V Spring Winder

Described as a compact, well constructed, dependable tool designed for use in industry, repair shops, and home workshops, the J-V Spring Winder shown in the accompanying illustration is now being marketed by J-V Industries, 19300 Waltham Ave., Detroit 5, Mich. The unit, which weighs approximately 4 lb., is designed to produce springs up to 1 inch inside diameter using wire up to $\frac{1}{8}$ inch in diameter.

Said to provide for a saving in time by eliminating the necessity of using a lathe

J-V Spring Winder



CARROLL DIVIDING HEADS



Catalog
on
Request



3 SIZES - 4 MODELS - 6" to 12"

TROYKE MFG. CO.

4422 APPLETON ST. CINCINNATI 9, OHIO

Speed Up Production With JULIUS MACHINE SHOP DOLLIES

For Handling Your Shop and Tote Boxes

Use either as dolly or with lift truck.
Standard sizes built to handle 1,000 lbs.
Special sizes to order. Prompt delivery.
State size of boxes and load to be carried
for quotation.

FRED S. JULIUS MFR.

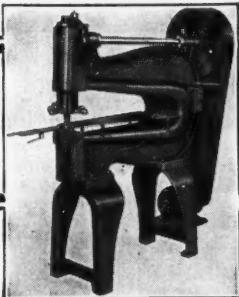
Racks - Skids - Trucks - Dollies
LANCASTER 5, PA.

SAVAGE

**NIBBLING
MACHINE**

**NIBBLE
YOUR COSTS**

Ask for
Free Bulletin "H"



Capacity $\frac{3}{4}$ "
mild steel

FOR TUBE SLOTTING, TUBE SHAPING
AND CUTTING FLAT SHEETS BY TEM-
PLATE OR TO A SCRIBED LINE.

Manufactured by

W. J. SAVAGE COMPANY

Knoxville

Since 1885

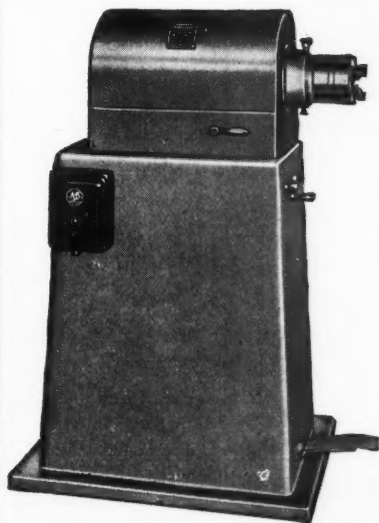
Tennessee

Pioneer Mfrs. of Nibbling Machines

SCHAUER SPEED LATHES LAP and POLISH

Metal and Plastic Parts

**Better, Speedier, at
Lower Cost!**



Production records prove that Schauer
low-cost Speed Lathes save time . . . in-
crease production . . . lower operating
costs . . . afford greater efficiency and
faster handling of parts requiring De-
burring, Filing, Lapping, Polishing.
There is a size and type of Schauer
Speed Lathe for almost every secondary
finishing operation.

Write for Catalog 480.

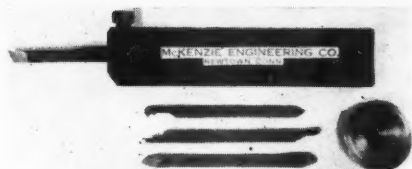
The Schauer Machine Co.

2060 Reading Rd. Cincinnati 2, Ohio

to wind springs for odd jobs, the J-V Spring Winder can be permanently mounted or employed in a bench vise when necessary. According to the manufacturer, the unit is not intended for making springs for production jobs or in quantity.

McKenzie All Purpose Lathe Tool Holder

An all purpose lathe tool holder which is designed to accommodate boring, threading, cut-off, and turning tools is



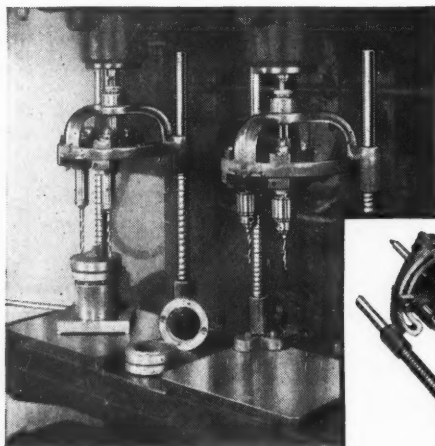
McKenzie All Purpose Lathe Tool Holder

announced by the McKenzie Engineering Co., Newtown, Conn. The holder is constructed to utilize the full length of each tool bit.

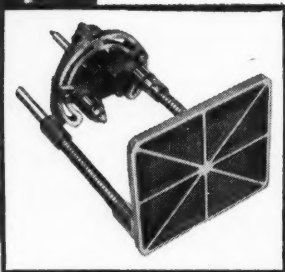
The bit for boring requires no forging but is simply ground on the end. Since it is rigidly held, the bit does not spring away from the bore. The boring tool bit can be set back for shallow holes and tapers down to $\frac{1}{16}$ -inch drill hole.

The tool bit for threading has one end ground for regular thread cutting operations and the other end ground for inside thread cutting operations. The bit can be removed for regrinding without disturbing the setting of the tool holder. The cut-off tool bit includes a narrow and a wide end. The turning tool bit is ground with a rake on one end for turning steel, and so on, and on the opposite end without a rake for brass and bronze.

Said to be ideal for bench type and other lathes, the tool holder is standardly made for $\frac{1}{8}$ and $\frac{1}{4}$ -inch tool bits, with tool holders of larger capacities available on special order.



Overarm Type has heavy guide pins, ground base 12 by 14 inches.



LINDERME 2-Spindle Head

"increased production from 160 to 600 an hour"

This story is typical of the many applications of Linderme 2-spindle drill heads on long and short runs. You'll like these features: drills, taps—in metal, wood, plastics; quick, accurate adjustment, $\frac{1}{2}$ " to 6" centers; two minute set-up on most drill presses in

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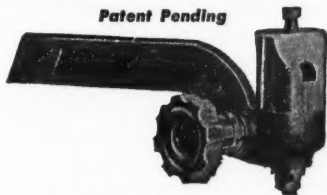
... because they're made of a special, correctly - heated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

You get more mark per dollar with THOR STAMPS. Write for catalog and prices.

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Monarch Precision SHAPLANE Radius Tools

Patent Pending



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RANGE $\frac{1}{2}$ " TO 3" RADIUS (MODEL ALSO
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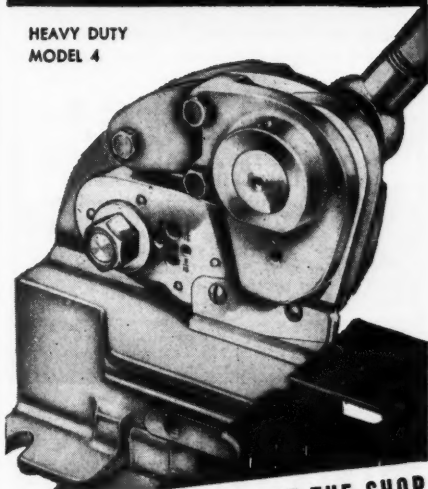
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4470 Oakenwald Ave., Chicago 15, Ill.
Phone Drexel 3571

SAVE TIME 4 WAYS WITH A
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MODEL 4



USE THIS HANDYMAN OF THE SHOP

FOR: ☐ OUTSIDE NIBBLING
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☐ SHEARING
☐ ROD CUTTING

● It's easy to cut irregular shapes with Heinrich No. 4 Handnib. Double crank construction does the trick . . . enables tool makers to speed up cutting of templates and trial blanks. It's rugged . . . takes $3/16$ " flat stock with ease . . . round stock to $3/8$ ". May be clamped in a vise or mounted on a bench. A request brings folder with full details.

NATIONAL MACHINE TOOL CO.
DEPT. 118-J • RACINE, WISCONSIN

"Red Ring" Shoulder Gear Shaving Method

A method of close shoulder gear shaving which is applicable to spur and helical gears or teeth which are tapered away from or toward the shoulder gears, such as in clutch gears used in automotive transmissions, has been developed by "Red Ring" engineers of the National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. The method involves the use of a specially developed conical involute cutter. Using such a cutter and tipping the work away from it is

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Special reaming problems solved

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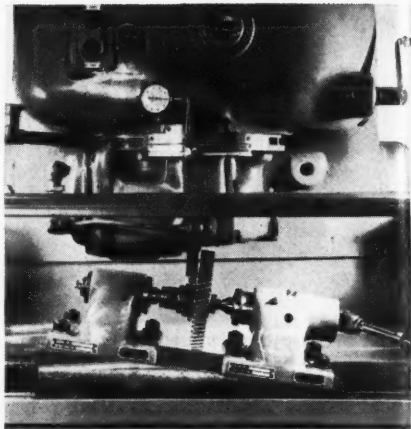


Illustration Showing a Close Shoulder Gear Being Shaved by the "Red Ring" Method

said to provide a sufficient angle between the axes of the cutter and work gear to attain an excellent cutting action, thus reducing machining time to a minimum.

The accompanying illustration shows a gear being shaved by the Red Ring Method. The work is set on an angle with the cutter towing into it. In this case, the clearance between the work gear and the larger gear is only $\frac{1}{8}$ inch.

Wolf $\frac{1}{2}$ -Inch General Duty Electric Drill

For general production and maintenance work, S. Wolf & Co., Ltd., P. O. Box 583, Grand Central Station, New York 16, N. Y., is offering the Wolf $\frac{1}{2}$ -Inch General Duty Drill shown in the accompanying illustration. The motor

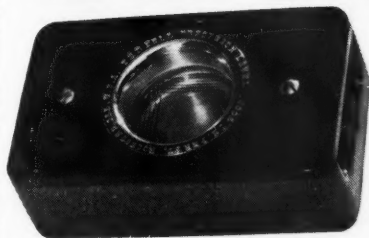
Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S. Inexpensive — Last for years. Write for Circular.

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The Fell Precision Level shows the level of all directions at once to an accuracy of .0005 inch per foot. It saves time in the manufacture and maintenance of machinery. Made in sizes $3\frac{1}{2}$ " x 6" and $5\frac{1}{2}$ " x 12", also 4" and 5" dia. for permanent mounting.

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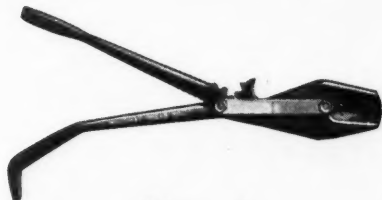
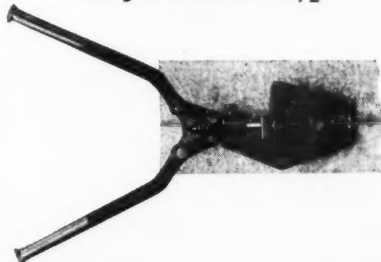
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Tool & Engineering Co.

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38 YEARS EXPERIENCE

No. 2 SHEAR

Capacity— $\frac{1}{8}$ " mild steel
Blade Length— $3\frac{1}{2}$ "
Weight—11 lbs.
Length Overall— $26\frac{1}{2}$ "

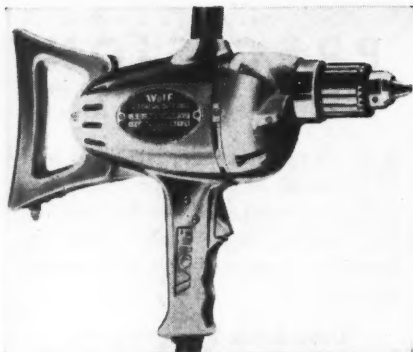


No. 9 Universal BUTTON PUNCH

Capacity—4 Thicknesses of 24 ga.
Throat Depth— $1\frac{3}{4}$ " Weight—10 lbs.

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WHITNEY METAL TOOL COMPANY
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Wolf 1/2-Inch General Duty Electric Drill

frame and gearbox are pressure die cast. The gears are made of nickel chrome and are high frequency heat treated. The gear spindle bearings are oil impregnated porous bronze, and the armature bearing is self-aligning. The chuck spindle thrust bearing is a ball type.

The scientifically shaped side handle of the Wolf 1/2-Inch General Duty Electric Drill includes a trigger switch and is

readily removable if desired. A lever-handle drill stand is available for use with the tool, the ratio of speed, power, weight, and shape of which is said to provide for ideal operational balance.

Viking Inserted Carbide Tool

A standard turning and facing tool embodying a mechanical locking device for an inserted solid carbide tool bit is now being marketed by The Viking Tool Co., P. O. Box 286, Nichols Rd., Shelton, Conn. The hardened semi-cylindrical wedge type lock located beneath the inserted solid carbide bit is actuated by a screw which locks or retracts the wedge, depending on its direction of rotation.

The toolholder is designed to adequately support the carbide tool bit and to completely house both the locking mechanism and the tool bit, thus allowing for the taking of unusually heavy cuts. The construction of the tool is such that only a very small percentage of the solid carbide insert is said to be required for locking purposes, since the locking action is effected very close to the actual cutting area of the carbide, thereby providing for maximum rigidity and long tool bit life. The carbide insert can be removed from

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FOR THREAD GRINDING TOOLS

DIAMONDS
FOR ALL INDUSTRIAL PURPOSES

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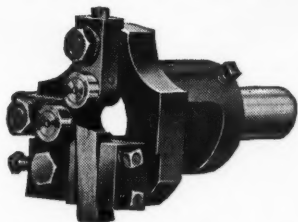
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A general purpose, tangent cut, roller rest box tool of wide range for turning diameters from bar stock, castings, forgings or other material. Applicable to all sorts of screw, turret and other machines, hand or automatic. It is simple to set and eliminates resetting when it is necessary to grind the bit. Write for descriptive folder giving complete information.

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The Luma combination etchtool and demagnetizer, etches, demagnetizes, anneals and solders. Permanently marks hardest steel with ease of a pencil. Write for complete information.

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"Good Cutting Oils Sure Keep You Out of Trouble"



...SAYS "CHIP" WRIGHT

"Whenever there's trouble with tools or finishes, or jobs fall behind schedule, the first thing I check is the cutting fluid, because when that's not exactly right, it's surprising how it can upset the whole job. You just can't get around it, cutting oils do make a big difference . . . and it isn't smart to quit trying until you find the right one. It doesn't make sense to put up with headaches that can be avoided. That's why I think it pays to rely on experienced cutting oil people. They come up with sound, practical assistance."

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for your toughest jobs

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D.A. Stuart Oil Co.
EST. 1885 LIMITED

2741 1/2 South Troy St., Chicago 23, Illinois

the holder without disturbing the holder set up in the machine tool. One complete turn of the screw permits the insert to be removed for regrinding in a simple fixture, while the toolholder remains in the machine with another insert replacing the dull one.

After regrinding, the insert is advanced in two directions, the major advancement being in the direction of the feed. This arrangement allows for a minimum removal of carbide in regrinding operations and permits full depth cuts to be taken for the complete life of the insert. A backing-up screw provides a means for adjusting the position of the cutting edge with regard to a built-in chip breaker.



Viking Inserted Carbide Tools

The Viking Inserted Carbide Tool is available in standard

shank sizes having $\frac{3}{4}$ to 2-inch tool heights in four styles; namely, straight style for shoulder work, 15-deg. nose angle style for roughing operations, offset style for close-to-chuck work, and offset facing style for facing operations.

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Can Be Used on ANY Milling Machine



A Kempsmith Circular Table is a precision tool. Handles a large variety of jobs . . . milling circles, segments of circles, large cams and irregular contours. Ideal for gear cutting and high-speed continuous milling. Power feed and indexing attachment optional. Ask for Bulletin No. 106.

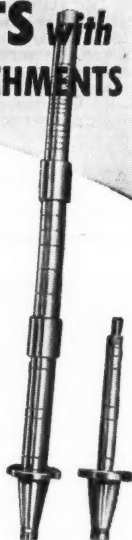
Kempsmith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

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Precision Built Milling Machines Since 1888



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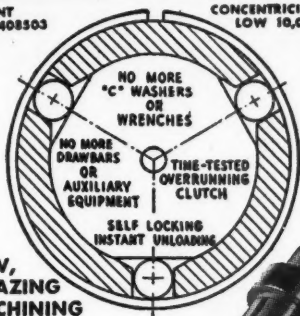
in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

S-T-M Precision Type

Identified as S-T-M Precision Type, a line of interchangeable steel type designed for stamping brass, aluminum, copper, steel, or hard rubber finished products, name plates, advertising or sales novelties, instruction plates, and practically any product requiring high grade marking has been announced by the M. E. Cunningham Co., 158 E. Carson St., Pittsburgh, Pa. The type is available in condensed medium, and extended Gothic characters in sizes ranging from $\frac{1}{8}$ to $\frac{1}{2}$ inch in light, medium, or bold face

PATENT
No. 2408503

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YOUNG PRECISION EXPAND-
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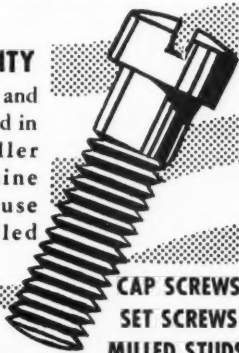
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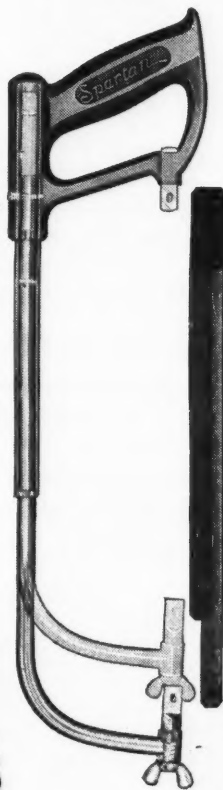
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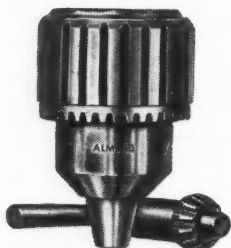


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**Maximum Gripping Power with
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Long Life.**

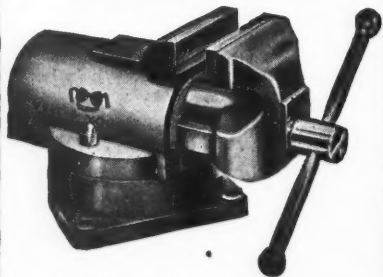
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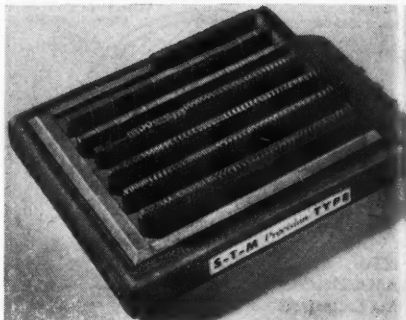
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Established 1926
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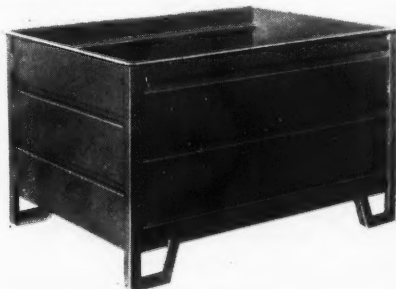
styles. The same range of character sizes, widths, and type faces are furnished in reverse style for stamping rubber, Bakelite, or plastic molds.

Engraved extra deep and on a 25-degree bevel, Cunningham S-T-M Precision Type is claimed to provide deep, clear-cut marks whether the characters are stamped directly into the the product or from the mold to produce a raised letter. The type is said to be excellent for the plain or roll leaf heat branding of plastic, Bakelite, or rubber products and can be furnished on any size body to suit a specific marking requirement or for use in a special holder or marking machine. Full font sets and assorted quantities are also available.

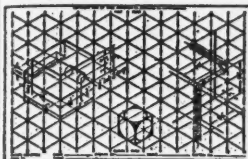
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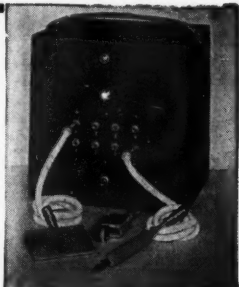
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9" — \$ 97.00

12" — 160.00

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18" — 350.00 Extra Heavy Duty

21" — 500.00 Extra Heavy Duty

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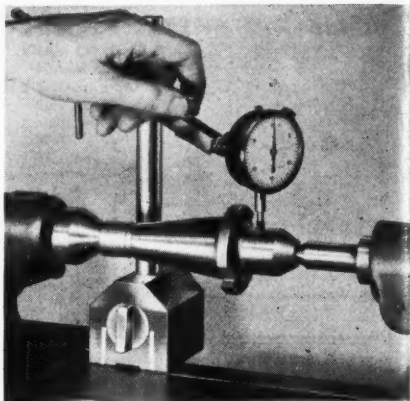
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a heavy corrugated steel box with legs designed to permit complete accessibility with a fork or power lift truck. The box can be made in any size or load capacity to meet user specifications.

Brown & Sharpe Dial Holding Rod

A dial holding rod with fine adjustment feature is announced by the Brown & Sharpe Manufacturing Co., Providence 1, R. I. The rod is available in two sizes of 0.375-inch diameter for dial test indicators Nos. 730, 733, 744, and 744A, and 0.738-



Brown & Sharpe Dial Holding Rod in Use

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BEND**

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Description	No. 2 Taper	No. 3 Taper
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SOUTH BEND LATHE WORKS

inch diameter for dial test indicators Nos. 731 and 731A.

In setting up a dial gage using the Brown & Sharpe Dial Holding Rod, the gage is first placed in the approximate position desired and the fine adjustment screw of the rod then turned, thus causing the gage point to contact the work and the pointer hand to swing to the required position on the dial.

J. C. Safety Abrasive Wheel

A safety abrasive wheel which is designed to prevent the possibility of accidents due to opening or breaking of a sanding wheel while in operation has been announced by the J. C. Manufacturing Co., 250 Seventh Ave., New York 1, New York.

Said to be guaranteed not to open while in motion, the wheel, which is available

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DIAMOND TRUING TOOLS

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Product of *Commander* . . . Builder of the *Multi-Drill*

***Light,
Easily
Handled,
Flexible.***



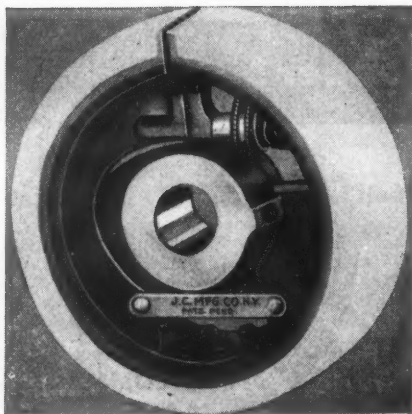
**SWEDISH
INTERNAL
INDICATOR
GAGE**

A reliable precision indicator especially designed for rapid, convenient and accurate measurement of internal diameters. Variations of as little as 0.00005" in size, out of round, and taper of bores can be quickly determined. Hundreds are in daily use on production lines and in inspection departments on innumerable applications where close limits on size, roundness and straightness of bore are of prime importance.

It can be set to any required size direct from Johansson Gage Blocks or Master Ring.

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J. C. Safety Abrasive Wheel

with a 5 or 6-inch outside diameter, has an all-metal frame with $\frac{7}{8}$ -inch bore, and utilizes a $1\frac{1}{2}$ -inch wide strip of abrasive cloth. Accurately balanced to ensure freedom from vibration, the wheel also features a 100 per cent wool felt cushion,

as well as a simple rotary locking mechanism for use in replacing the abrasive cloth.

Dayton Rogers Layout Fluid

The Dayton Rogers Manufacturing Co., 2835 S. 13th Ave., Minneapolis 7, Minn., announces that its layout fluid for machinists, toolmakers, diemakers, modelmakers, metal patternmakers, sheet metal workers, and oxyacetylene cutting is now being supplied in new packages with a new solvent added, thus making the fluid a fully universal layout material. According to the manufacturer, the material provides a dark background against which scribed lines have a pronounced contrast, thereby relieving eye-strain and allowing the workman to work accurately and easily to the desired layout. The compound may also be used to advantage in layout work on brass, aluminum, stainless steel, tin, copper, and so on.

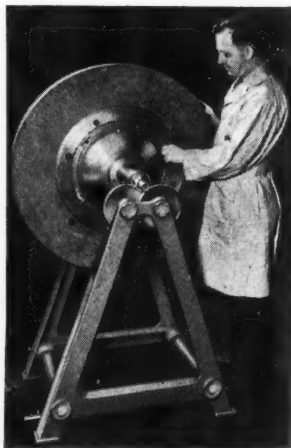
Use of Dayton Rogers Layout Fluid is claimed to eliminate the need for polishing of the surface to which it is to be applied. The material can be readily brushed on a surface that has been wiped

Anderson BALANCING WAYS

Shops handling rotating parts find this simple, sturdy and thoroughly dependable device highly efficient for balancing and truing operations. It assures better work . . . saves time . . . saves labor. No leveling required.

Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.

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40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000



Write for Bulletin No. 9-22



ANDERSON BROS. MFG. CO., Rockford, Ill.
Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

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Consult SEIBERT engineers before retooling or replacement. Cut maintenance cost.

Price • Delivery • Quality



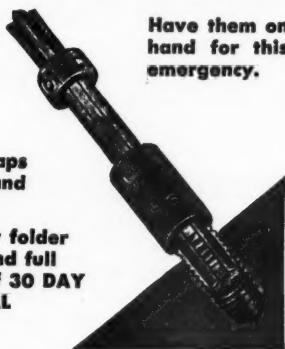
Quality

Manufactured by
Seibert & Sons, Inc.
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DON'T WAIT UNTIL TAPS BREAK OFF — and then wish you had a set of WALTON Tap Extractors

Remove Broken Taps Quickly and Easily.

Write for folder No. 10 and full details of 30 DAY FREE TRIAL OFFER.



Have them on hand for this emergency.

THE WALTON COMPANY
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INSERTED CARBIDE TOOLS with MECHANICAL LOCK



Positive, vibration-proof lock makes tool bit an integral part of holder. Cuts can be taken to full depth of carbide. Dull tools can be changed without removing holder from machine. Built-in mechanical chip breaker.

Shank dimensions from $\frac{3}{4}$ " x $\frac{3}{4}$ " x 6" to $1\frac{1}{2}$ " x 2" x 7". All standard turning and facing styles.

Put these tools to work in your shop and enjoy lower costs.

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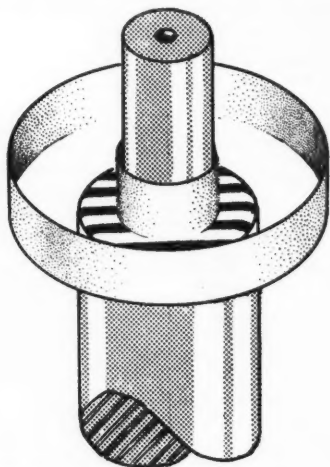
VIKING TOOL CO.
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fairly clean and is said to dry instantly. The fluid is offered in 4-ounce, pint, quart, and gallon containers and 55-gallon drums.

Acme Ring-Shaped Optical Flat

For checking ring seals in assembly and for checking integral shoulder seals, the Acme Scientific Co., 1450 W. Randolph St., Chicago 7, Ill., has added to its line of light wave measuring equipment a ring-shaped optical flat with hole.

cording to the manufacturer, the ring-shaped optical flat makes it easy to check the sealing ability of seals actually mounted on shafts and of flat shoulders



Acme Ring-Shaped Optical Flat

lapped integrally on shafts. Units which leak can thus be detected long before assembly, thereby minimizing rejections.

MEINHARDT

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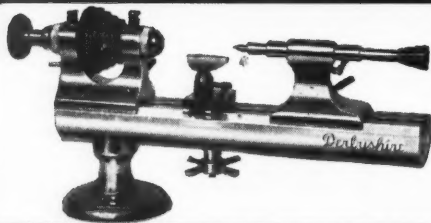
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Errington Auto-Reverse Turret Lathe Tapping Head

Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y., announces the Errington Auto-Reverse Turret Lathe Tapping Head which enables the user to tap a hole and back out the tap without stopping the work or reversing the



The WEBSTER-WHITCOMB

World famous for its
accuracy, dependability
and fine workmanship.

Chuck capacity .1969"
12" Bed, Swing 3.94"

Lathe Makers
Since 1874

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LOW COST LOCATING BY CENTER SCOPE

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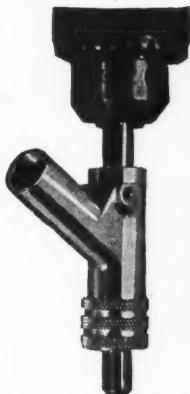
Ample Adjustment
For Spindle
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Bulletin M-12.

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*Interchangeable
Type and holders
for every
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*Ask for
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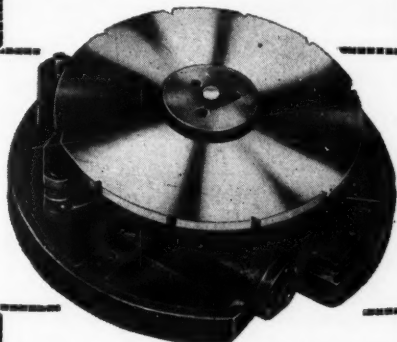
147 Jos. Campau

Detroit 7, U. S. A.

THE NEW AIR-OPERATED ALLEN DIAL FEED TABLE

For use with PUNCH PRESS, DRILL PRESS,
PRODUCTION MILLER, SPOT WELDER, ETC.

SOLVE THAT SPECIAL PROBLEM



MODEL A— Dial Feed Table timed by
the machine to which it
is to be synchronized.

Available in 2 sizes

No. 7½-A—7½" Index Plate,
9" base, 21½" overall height... **\$125.00**

No. 11-A—11" Index Plate,
14" base, 4" overall height... **\$175.00**

Special Index Plates available with from
8 to 40 notches. 12-position is standard.

MODEL B— Will automatically index
with speed adjustable
from 1 indexing each half second to 1 each
ten seconds.

Available in 2 sizes

No. 7½-B — (specifications
same as 7½-A)..... **\$155.00**

No. 11-B — (specifications
same as 11-A)..... **\$205.00**

ACCESSORIES— specially designed for use with
Allen Dial Feed Tables.

- Air-operated down clamps and side clamps with 4X power factor are available for holding the work piece.
- Knockout for ejection of the work piece from the index plate.
- Special 2 and 3-way valves to synchronize the clamps and knockout with the table motion and thereby tremendously increasing the versatility of operation.

Prices F.O.B. Brooklyn, N. Y.

• Write for illustrated brochure.

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Exclusive manufacturers of Dial Feed Tables

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PROBLEMS**

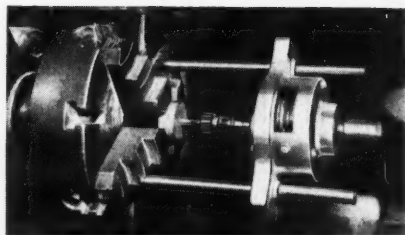
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COUNTERBORES
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BICKNELL-THOMAS COMPANY
Greenfield Massachusetts



Errington Auto-Reverse Turret Lathe Tapping Head Set Up for Use

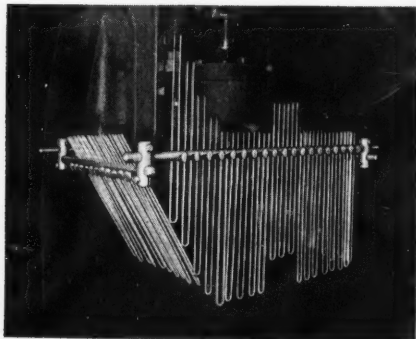
machine in a turret lathe setup. Easy to operate, the head is arranged so as to feed the tap into, and out of, the drilled hole while the work is turning in one direction. With the aid of a friction chuck, blind holes can be tapped without any possibility of tap breakage, it is claimed.

The Errington Auto-Reverse Turret Lathe Tapping Head can also be used on drill press work for production tapping. For such operations, the head has a 2-to-1 reverse and utilizes guide bars to hold and steady the case.

Humm Adjustable Rod Guard

An adjustable rod guard which can be used for the safeguarding of blanking operations on machines such as power presses, and so on, is now being manufactured by the John Humm Safety Equipment Co., 253 Sheffield Ave., Brooklyn 7, N. Y. Quickly adjustable, the guard is so constructed that the sides and front may be tilted and the rods easily raised or lowered.

Humm Adjustable Rod Guard

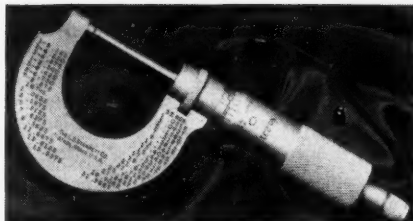


The Humm Adjustable Rod Guard is made to fit the particular press equipment on which it is to be installed.

Starrett Satin Chrome Micrometer

The L. S. Starrett Co., Athol, Mass., announces that Starrett micrometers, including friction thimble and black frame types, will now be furnished with a satin chrome finish. The finish is produced by a special process which, it is claimed, results in a glare-free non-reflecting surface against which markings and graduations stand out sharp and clear under any illumination. The finish is also said to be highly resistant to stains and corrosion.

Other important refinements which are also now standard features of each Starrett micrometer include a "Hi-Micro" (mirror-like) finish on the faces of the anvil and spindle to ensure accurate measurement; micrometer screw hardened, stabilized, and with threads ground from the solid; quick-reading figures with every graduation on the thimble numbered for positive identification; decimal equivalent of 8ths, 16ths, 32nds,



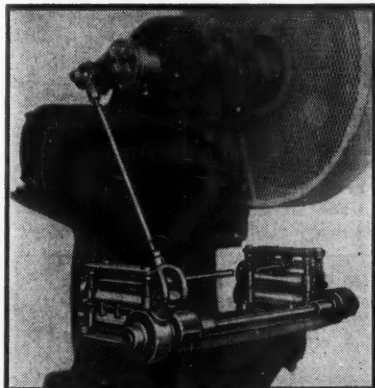
Starrett Satin Chrome Micrometer

and 64ths conveniently marked on the frame; and simple adjustment to compensate for wear.

"Jiffy" Production Service for Dies, Jigs and Fixtures

"Jiffy" Production Service for manufacturers and punch press shops utilizing dies, jigs, and fixtures is announced by the An-Dean Mfg. Co., Inwood, Ind. The service involves a process of tipping and centering salvaged die punches which can then be ground down by the user and employed for any smaller diameter holes. With the process, the Rockwell

Increase the efficiency of your punch presses with . . . AUTOMATIC ROLL FEEDS



A La Bahn Double Roll Feed Installation

- Easily attached to any press.
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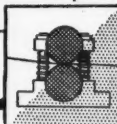
Standard models from 3" to 12" wide with up to 18" advance in both single and double feed models. Larger feeds and longer advances can be made to your specifications.

We also manufacture a complete line of Stock Reels, Stock Straighteners, Wire Straighteners and Scrap Cutters.

Write today for literature and quotation forms. La Bahn Machinery and Mfg. Company, Dept. MMS, Metuchen, N. J.

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ROLL FEEDS • STOCK REELS



MACHINE & MFG. CO.

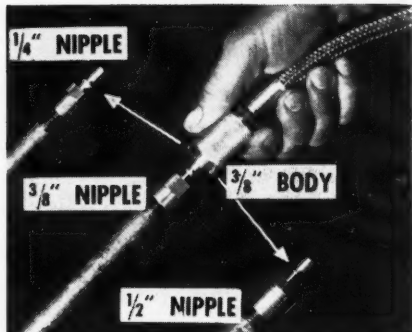
METUCHEN • NEW JERSEY

STOCK STRAIGHTENERS • SCRAP CUTTERS

hardness of salvaged parts is said to be retained and, in most cases, raised from 1 to 2 points.

Ronaflex Improved Flexible Tubing Assemblies

Increased convenience for the user and a substantial reduction in flexible tubing parts inventory are said to be provided through the improved flexible tubing assemblies announced by the Ronaflex Tubing Co., Inc., Packard Bldg., Phila-



Ronaflex Improved Flexible Tubing Assemblies

delphia 2, Pa. The assemblies comprise flexible tubing with snap-on couplings and are interchangeable on various nipples. As illustrated herewith, the $\frac{3}{8}$ -inch coupling body fits $\frac{1}{4}$, $\frac{3}{8}$, and $\frac{1}{2}$ -inch nipples. The $\frac{1}{4}$ and $\frac{1}{2}$ -inch bodies also fit all three nipples.

The degree of interchangeability varies with the type of coupling and with the size. For example, the $\frac{1}{4}$ and 2-inch regular coupling bodies are interchangeable with $1\frac{1}{2}$ and 2-inch nipples. Thus, a limited number of sizes of Ronaflex Assemblies are said to fit a wide variety of nipple sizes.



Spiral Flute COUNTERSINKS

Aero Spiral flute HSS Co-sinks and chatter, cut clean and accurately. Stocked in 60, 82, 90, 100 degree included angle, $\frac{3}{8}$ ", $\frac{1}{2}$ " diameter, with $\frac{1}{4}$ " shank and $\frac{3}{4}$ ", and 1" dia. with $\frac{1}{2}$ " shank. If not available from your Mill Supply dealer order direct.

AERO TOOL COMPANY
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**ALL
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PORTABLE SHEARS

**FULLY
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Two Sizes

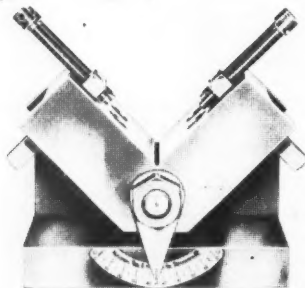
No. 1 cuts up to No. 11 gauge strip or sheet.
No. 2 cuts up to $\frac{1}{4}$ " steel plate.

BREMIL MFG. CO.

1400 Pittsburgh Ave. Erie, Pa.

"Multicut" Solid Carbide Turning Tool

Known as the "Multicut," a turning tool consisting of a solid Wessonmetal carbide blank and a sturdy holder is now being produced by the Wesson Co., Dept. MMS, 1220 Woodward Heights Blvd., Ferndale 20, Mich. The tool can be ob-



THE MONTGOMERY SWIVAL CLAMPING BLOCK

1. Swivel 90 degrees from center on both sides.
2. Hardened and ground.
3. Working surfaces up to $3\frac{1}{2}$ x $5\frac{1}{2}$ ".
4. Bases up to 15x5".
5. Available without bases and in other styles.
6. For use on LATHES, MILLERS, GRINDERS, DRILLS, ETC.

Priced From \$35

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Send on company letterhead for complete catalog

MONTGOMERY & COMPANY INC.
53 Park Place New York 7, N. Y.



"Multicut" Solid Carbide Turning Tools

tained in designs for use with Wessonmetal inserts of round, square, and triangular shapes. Tools for use with special shapes of inserts can be designed on order.

With the Multicut, the insert is rotated

about its axis to present new sharp cutting surfaces to the work without removing the toolholder from the block. When one side becomes dull, the insert can be turned end for end to provide for another cutting cycle. By a simple grinding operation on both ends, the insert can be sharpened for another double cycle of cutting operations. Various grades of Wessonmetal carbide are available for different applications in 1½-inch long inserts.

The Multicut Solid Carbide Turning Tool is offered in shank sizes ranging from ¼ inch square to 1 x 1½ inches. Standard Wessonmetal inserts range from ⅜ to ½-inch inscribed circle triangles.

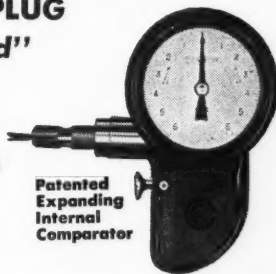
Clipper Diamond Scribe

A scribing tool consisting of diamonds specially selected for their cutting qualities and set into a hexagonal aluminum handle 6 inches long is now being marketed by the Clipper Diamond Tool Co., Inc., 21 W. 46th St., New York 19, N. Y. Said to write on any surface no matter how hard, the scribe is claimed to have a wide scope of application in scribing

Here's COMTORPLUG the "Unrestricted" Internal Gage

Gages precision
bores to fractions
of .0001".

"Unrestricted"
because —



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COST is so reasonable as to be practical for all quantity gaging applications.

PORTABILITY. Available anywhere instantly. Weighs but a few ounces. No hose, wire or fixtures.

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SCOPE. Measures holes ⅛" to 8" dia. and larger, to fractions of one ten-thousandth. Shows true diameter and reveals out-of-round, front or back taper, barrel shape, bell mouth. Measures extreme bottom of blind holes.

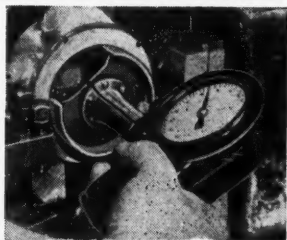
DEFINITENESS. Not a passing reading, but a fixed, definite reading, assured by automatic features independent of human errors or variations of feel or judgment.

Request Bulletin 33

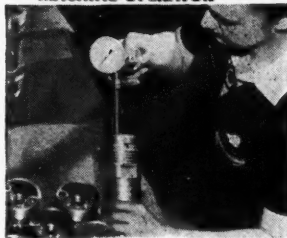
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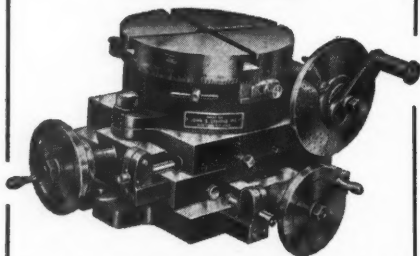


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Other Comtor Products:
"COMTORGAGE," Precision External
Comparator: Bulletin 30
COMTOR SURFACE SMOOTHNESS
COMPARATOR: Bulletin 32A

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We also make a No. 2 Size for 12" Rotary Table. Can be had without Rotary Table.

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and etching on metals, glass, and plastics.

Designed for use in toolrooms, metal-working shops, chemical laboratories, and so on, the Clipper Diamond Scriber



Clipper Diamond Scriber

can be used for marking names or identification symbols, as the marking medium in a pantograph, for laying out materials that are to be cut or otherwise worked, and numerous other jobs.

Eclipse Stub Core Drill Holder

A short series holder for use with standard core drill cutters is announced by the Eclipse Counterbore Co., 1600 Bonner Ave., Detroit 20, Mich. The holder is available in four sizes. The smallest size is 1¼ inches in diameter and is designed to accommodate Eclipse standard core drill cutters from 1¼ to 1½ inches. The next size is 1½ inches in diameter and is designed to accommodate cutters from 1½ to 2 inches. The third size is 1¾ inches in diameter and is intended for driving cutters from 2¼ to 2½ inches while the largest size measures 2 inches in diameter and is constructed to accommodate cutters from 2½ to 3 inches inclusive.

The Eclipse Stub Core Drill Holder,



Eclipse Stub Core Drill Holder

while designed primarily for relatively shallow hole operations in turret lathes, can also be used for similar operations in drilling machines. Made without flutes, the holder, as a result of its short construction, is said to reduce to a minimum the time and effort required on the part of the operator in backing the lathe turret away to clear the holder when indexing. Claimed to afford maximum rigidity, the holder is produced with a standard Morse taper shank.

New Books

Molybdenum: Steels, Irons, Alloys. By R. S. Archer, J. Z. Briggs, and C. M. Loeb, Jr. Published by Climax Molybdenum Co., 500 Fifth Ave., New York 18, N. Y. 391 pages. 188 figures. 91 tables, plus appendices.

The varied applications of molybdenum as an alloying element are described in this book, which covers a wide range of materials from wrought to cast steels and from cast iron to non-ferrous alloys. The major emphasis has been placed on the presentation of the fundamentals that must guide all engineers, designers, and metallurgists in their selection of the most suitable materials for a given application. An attempt has been made to show the fields of similarity and dissimilarity of the various materials and to indicate some of the factors that may affect the choice of the most economical material for a specific part.

The scope of the book is illustrated by the main section headings: Technical Effects of Molybdenum, Fundamental Effects of Heat Treatment on Microstructure, Addition of Molybdenum, Wrought Alloy Engineering Steels, Wrought Corrosion Resistant Steels, Wrought Steels for Elevated Temperature Service, Tool Steels, Steel Castings, Cast Iron, Special Purpose and Non-Ferrous Alloys.

Considerable recent information is included, not only on the more prominent developments, such as the gas turbine steels and alloys, but also on the work that has served to clarify

the factors affecting the service life of the lower alloy steels. The references to current literature are adequate to facilitate further reading by anyone who desires more detailed data.

A valuable addition is the compilation of much rather obscure hard-to-find information on some of the specialty applications, such as exhaust valves, elevated temperature springs, ferritic gas turbine steels, high permeability alloys, contact materials, grid wires, and prosthetic alloys. The appendices include data on standard compositions of American, British, and French engineering steels, working stresses from the Boiler Code,

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SAW**



twice the power on the cutting stroke due to a special gearing arrangement.

Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting

guide at the same time. Transa guns are used extensively in machine shops, assembly plants, fabricating industries, repair and shipping departments.

At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

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TRANSA INC.

440-45 Gateway Bldg.
Minneapolis, Minnesota

conversion tables, and the physical properties of metallic molybdenum.

Copy of the book is available free to metallurgists and others closely connected with the metallurgical industries.

American Machinists' Handbook. 8th edition. By Fred H. Colvin and Frank A. Stanley. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. Price, \$6.00.

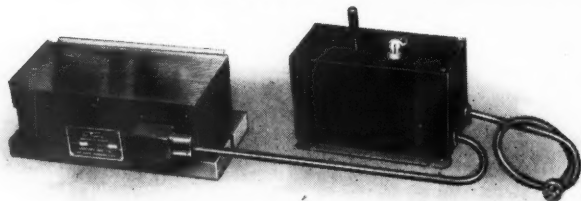
This edition of the "American Machinists' Handbook" provides the machinist,

metal worker, toolmaker, draftsman, designer, foreman, and supervisor with up-to-date information on machine shop practice, including accurate definitions, helpful tables and standards, clear graphic sketches and diagrams, and other tested data. The handbook has been expanded to include the latest wartime developments available for peacetime production. "Kinks," new materials, processes and operations, tables, and standards now in use are presented in handy form.

In addition to providing a thorough background of the fundamentals of lay-

outs, feeds, speeds, tools, jigs, fixtures, and standards, the handbook brings the reader abreast of wartime advances in high speed milling, induction heating, wire measurement, drilling hardened steel, knurling, turning, and cutting and forming aircraft sheet-metal work. In the Screw Machine Tool Section, the handbook incorporates complete data on several different methods of camming automatics for both solid and self-opening die heads; sketches and data covering the different types of knurling tools for automatics and their uses, including a full explanation of top and bottom and side knurls; information on standard forming tool blanks (circular and dovetail)—their revised standards and capacities of machines using them; a new method for design calculations of circular form tools which allows for depth of cut in the tool to reduce the diameter of the

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Gives you all the advantages of magnetic chucking for your smaller machines—or for bench work. You'll get fast chucking—and save money by eliminating costly fixtures. Versatile for holding large and small parts on scores of jobs around the shop. Holds work to edge of face plate. Built for "wet" operation under coolants and cutting oils.

MAGNA-LOCK Model HR510C has 5" x 10" working surface, is 4" high. Complete with separate rectifier, built-in switch. Simply plug into AC line and begin work!

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Magnetic Chucks and Devices

BIG RAPIDS, MICHIGAN, U. S. A.

work on the automatic and practical know-how lists for the set-up man and operator in camming and setting up for threading operations.

The entire Colvin and Stanley "War-time Data Supplement" containing many helpful new methods developed in war production is also provided in the book.

Metals Handbook. 1948 Edition. Published by American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. 1,444 pages, 8 x 11 inches, 1,590 illustrations, 975 tables, 803 titles, 603 contributors. Price, \$15.00.

Larger in size than any previous edition prepared by members-scientists of the ASM, this edition of the "Metals Handbook" covers the extended concepts and research which grew out of war production but which, for security reasons, were held in abeyance. Over 600 engineering and production specialists contributed over one million words on the various methods of producing thousands of different metal items used in making modern civilization still more modern, more comfortable, and safer.

The handbook is divided into four principal sections: General; Ferrous Metals; Nonferrous Metals; and Constitution of Alloys. Included are 74 articles on metals, processes, and methods in the general section. Among these are new summaries of wear, oxidation, stress corrosion, re-

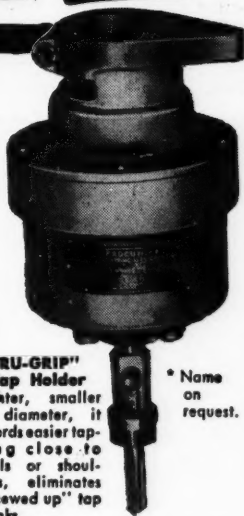
lief of residual stress, and service failures. One hundred and thirty-one authoritative articles cover Ferrous Metals, from the manufacture of iron and steel, through shaping, testing, structural properties, welding, heat treating, and finishing to the practical business of hardening, coating, and surface treatment.

Contained in the handbook are 102 articles and 220 data sheets on Nonferrous Metals, including discussions of melting, shaping, treating, and corrosion. The handbook also contains a new section on



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That's what they all say . . . men who have used Procunier Tapping Heads in the shop for years. Consistent, accurate tapping and faster tapping with a minimum of tap breakage . . . as reported by actual users over the years . . . has made "Procunier" the standard of the industry. The sensitive, double-cone friction clutch, which engages the surfaces of the drive and reverse shells with a soft, "cushioned" action . . . the heat-treated reversing mechanism . . . the ball bearings for accuracy . . . the single-hole lubrication, have made Procunier noted for consistently better performance. See how these Procunier Heads . . . proven on all kinds of jobs for over 30 years . . . can save you time and money.



**"TRU-GRIP"
Tap Holder**
Lighter, smaller in diameter, it affords easier tapping close to walls or shoulders, eliminates "chewed up" tap shanks.

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the eight precious metals. An extensive collection of alloy phase diagrams is presented in the Alloys section.

Who, Me? . . . Pointers in Job Management. By Arthur O. England. Published by National Foremen's Institute, Inc., Deep River, Conn. 24 pages, 4 1/4 x 6 1/4 inches. Two-colored paper cover. Price, 25 cents.

Every executive charged with the responsibility of supervising men and women is thereby entrusted with the most intricate operation of industry—the creation of better human relations among the individuals who work together in his group. What lever should he pull to obtain confidence, what button should he push to gain better workmanship, how can he use the oil of human understanding to better his production record? This booklet, copiously illustrated by Palmer and attractively printed in red and black, utilizes short, punchy text and cartoons to make its all-important information interesting and easily understood.

The contents of the booklet are as follows: Foreword; Say, Bub (Responsibilities); What Do You Know About People?; Talk to People; Build Confidence;

Give Credit When Due; Tell Your People of Changes; Make the Most of What You Have; Ask for Suggestions; Make Them Feel Important; Develop Initiative; Be Courteous; Be Honest; Be Fair; Make Them Feel They Belong; Treat Them with Dignity; Where's, the Pay-Off?; Getting Dependability; and Getting A Good Day's Work.

A short Course in Human Relations. By F. C. Minaker. Published by the Dartnell Corporation, 4660 Ravenswood Ave., Chicago 40, Ill. 52 pages, 3 1/2 x 6 inches in size. 10 illustrations. Paper cover. Price, less than 100 copies, 25c each. More than 100 copies, depending on number ordered.

This "Short Course in Human Relations" is a pint-sized refresher course for foremen and supervisors on the knack of getting along with the people who work under their direction. The text is divided under subheadings beginning with "Getting Along With People" and following with such subheadings as "What Kind of Foreman Are You?", "Leader or Boss?", "How To Get Along with Others," and so on. The text is further subdivided by subheadings under which the author discusses the easy-going foreman, the hard-boiled foreman, the art of praising, developing leadership, taking workers into your confidence, bolstering up the ego, importance of workers' confidence, the technique of interviewing employees, and so on. At the end of the book is a chart by which the foreman can rate himself.

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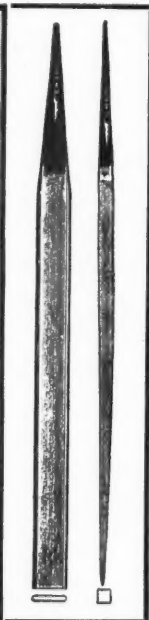
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New Shop Literature

Ground Flat Stock. Marshall Steel, Box 58-C, Lisle, Ill., is now issuing a two-color catalog containing information on three different kinds of ground flat stock; namely, water die, air die, and oil die. Copy free upon request.

Viking Mechanical Locked Inserted Carbide Tools for machining steel, cast iron, and non-ferrous and non-metallic materials are illustrated, described, and listed in an eight-page catalog now being distributed by The Viking Tool Co., Shelton, Conn. Covered are various styles of turning tools, boring bars, face mills, half side mills, blades, tool bits, grinding jigs, and tool sharpening fixtures. Copy of Catalog No. 1-48 free upon request.

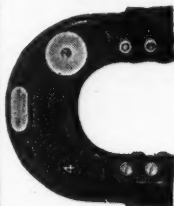
"Titeflex" All-Metal Flexible Tubing is illustrated and described in a 24-page catalog published by Titeflex, Inc., 677 Frelinghuysen Ave., Newark 5, N. J. In addition to brass tubing, the catalog describes the company's new bronze tubing for nominal steam pressure applications, Monel and stainless steel tubing for higher temperatures and corrosion resistance, and Inconel tubing for extremely high temperatures. Included are specifications for standard fittings and illustrations of typical assemblies with these fittings. The catalog also describes Titeflex bendable pipe, high frequency conductors, and vibration eliminators. Copy of Catalog No. 113 free to executives.

Jarvis Flexible Shaft Machines. A 36-page two-color catalog published by The Charles L. Jarvis Co., Middletown, Conn., fully illustrates and describes a line of multiple and single speed flexible shaft machines for use in performing rotary filing, grinding, disc and drum sanding, wire brushing, buffing, cutting, cleaning, and other operations. Covered are bench, floor, overhead trolley suspension, overhead saddle suspension, and truck type machines, as well as flexible shafts, ball bearing handpieces, right angle gears, sanding drums, wire brushes, grinding wheels, polishing heads, and other tools for the flexible shaft machine. In addition, the catalog contains engineering and maintenance data on Jarvis power tools. Copy of Catalog FSM-1 free upon request.

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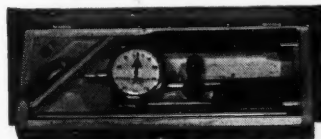
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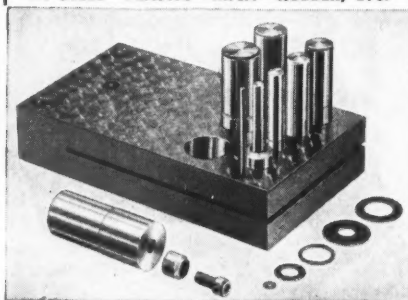
198-A Lafayette St. New York 12, N. Y.

H-P-M "Smooth Line" Laboratory Press, a 20-ton capacity self-contained unit for briquetting, tensile testing, extracting, molding, laminating, compression testing, and other operations, as well as for production work, is the subject of a six-page two-color illustrated bulletin published by The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. The bulletin provides an interesting description of the operation of the press, as well as diagrams showing the use of various fixtures and attachments available as optional equipment. Copy of Bulletin 4801 free upon request.

Cincinnati General Catalog M-1646. Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio, now has available a 44-page catalog presenting illustrations, descriptions, and tabular data regarding machines for milling, broaching, cutter sharpening, grinding, lapping, and flame hardening. Information on cutting fluid is also contained in the catalog, copy of which can be obtained by mechanical executives addressing requests on their company letterheads.

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Hoffman Filtration Equipment. The U. S. Hoffman Machinery Corp., Filtration Division, 219 Lamson St., Syracuse 6, N. Y., now has available a four-page two-color folder illustrating and describing a complete line of filtration equipment, including flotation units, disc filters, cartridge filters, oil conditioners, pressure filters, vacuum filters, and vacuum stills. Copy free upon request.

Bellows Non-Rotating Air Motors are featured in a 16-page three-color bulletin published by The Bellows Co., Akron, Ohio. The bulletin fully illustrates and describes the construction features of the motors and depicts and explains their use in performing various pulling, pushing, and lifting operations. Diagrams of the various models of motors, together with corresponding tabular data, are included in the bulletin. Copy of Bulletin BM20 free upon request.

Severance Tool Bulletin 16-C. Published by Severance Tool Industries Inc., 724 Iowa St., Saginaw, Mich., this bulletin presents on page 1 a complete listing of chatterless countersinks ranging in sizes from 5/8" to 2 inches in diameter in both the standard and heavy duty type groups. In the middle of the page is a table of suggested countersinking speeds. On page 2 is a complete feature of the Severance Ball Seat Reamers, providing information on uses, materials on which the ball seat reamers can be used, machines used for driving, finishes obtainable, operating speeds, lubricants, and so on. On page 3 similar detailed information is presented regarding ball nose drills, taper reamers, and drill reamers. Copy of Bulletin 16-C free upon request.

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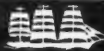
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Taylor-Winfield Tri-Phase Resistance Welders, available for spot, projection, seam, and upset butt welding, are shown and described as to features, advantages, operation, and so on, in an eight-page two-color bulletin issued by The Taylor-Winfield Corp., Dept. MMS, Warren, Ohio. Copy of Tri-Phase Bulletin 10-813 free upon request.

Sarco Type SWV Steam and Water Mixer, which is designed to provide hot water at isolated points, is described in Bulletin No. 900 issued by the Sarco Co., Inc., Empire State Bldg., 350 Fifth Ave., New York 1, N. Y. Cutaway photographs show the operation, method of installation, and construction of the unit. Convenient capacity and dimension tables are included. Copy of Bulletin No. 900 free upon request.

Brass Rod Mill Depots. The Titan Metal Manufacturing Co., Dept. MMS, Bellefonte, Pa., has published a four-page two-color folder illustrating and describing its two brass rod mill depots at Indianapolis, Indiana, and Bellefonte, Pennsylvania. Included is a map showing the important industrial centers in Eastern and Central United States which are within overnight shipping distance of the two depots. Copy free upon request.

Landis Tool Type F Hydraulic Cylindrical Grinders. A 24-page two-color catalog announced by the Landis Tool Co., 16 E. 6th St., Waynesboro, Pa., illustrates and describes a series of hydraulic cylindrical grinders consisting of plain, cap, and roll types which are made to accommodate work 14, 16, 20, or 24 inches in diameter and in varying lengths up to 240 inches between centers. Complete specifications are presented for each of the four types of precision cylindrical grinders discussed and 47 illustrations and line drawings are employed to clearly show the features of the machine. Copy of Catalog F-48 free upon request.

Stanley No. 88 Replaceable Bit Screw Driver for both Phillips and slotted head screws is illustrated and described on a three-color catalog page published by Stanley Tools, New Britain, Conn. Prices of the driver and of replaceable bits for use with same are included. Copy of Catalog Page 119A free upon request.

Ames Dial Gage and Indicator Catalog No. 57. Published by the B. C. Ames Co., Waltham 54, Mass., this four-page two-color catalog illustrates and describes the complete line of measuring and testing instruments offered by the firm, including various types and sizes of dial indicators, dial measuring instruments, and dial comparators. Copy of Catalog No. 57 free upon request.

Webber Micro-Accurate Gage Blocks. An eight-page two-color folder illustrating and describing a complete line of standard gage blocks and presenting non-technical details of the process employed in their manufacture is now being issued by the Webber Gage Co., 12900 Trisket Rd., Cleveland 11, Ohio. Copy free upon request.

"Economy" Stock Pusher with ground threads to assure concentricity and easy adjustment and designed to feed to the very end of the stock is illustrated and described in a leaflet now available free from the Sheffer Collet Co., Traverse City, Michigan.

Talide Tungsten Carbide Tools and Tips are covered in a revised catalog announced by the Metal Carbides Corp., Youngstown, Ohio. The catalog incorporates the standard identification numbers recently adopted by the carbide industry and also lists several new styles and sizes of cutting tools and tips. Copy of Catalog 48-T free upon request.

Verson Hydraulic Presses. A 16-page catalog issued by the Verson Allsteel Press Co., Dept. MMS, 9300 S. Kenwood Ave., Chicago 19, Ill., provides full details and specifications on its line of hydraulic presses in capacities from 75 to 5,000 tons. Also included is a detailed description of the "Hydrol" Speed Circuit, a new simplified hydraulic system that is said to minimize high pressure piping and valving. Copy of Catalog H-47 free.

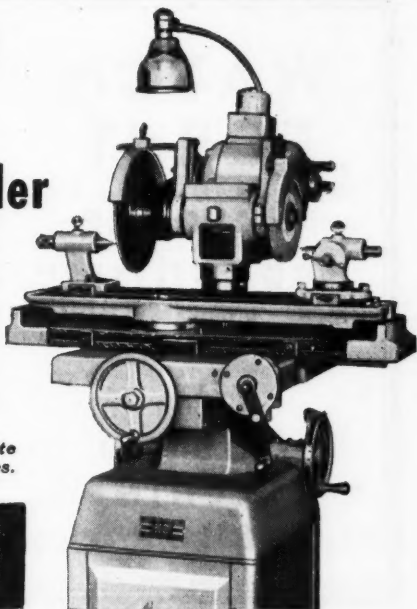
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Waltham Thread Milling Machines. The Edward Blake Co., 437 Cherry St., West Newton 65, Mass., is now distributing an eight-page two-color bulletin which fully illustrates and describes redesigned Waltham Thread Milling Machines for the fast precision threading of small parts. Covered are method of operation, details of construction, attachments, special purpose models, quality factors in thread milling, and general specifications. Also included in the bulletin is a table listing threads that can be cut on a standard model of Waltham Thread Milling Machine. Copy of Bulletin No. 248 free.

"Surface" Oil Standby Equipment for the operation of "Surface" gas furnaces with fuel oil is the subject of an eight-page two-color bulletin issued by the Surface Combustion Corp., Toledo 1, Ohio. Illustrated and described are two large installations in which heat treating and bluing furnaces were maintained in operation during critical periods by the use of the oil standby equipment. Also covered are the controls and additional equipment required, as well as the fuel oil specifications, of these burners. Copy of Bulletin No. SC-139 free upon request.

**WATCH
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October
"FREEDOM"
Issue
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MACHINE
SHOP**

"Automatic Balancing of Grinding Wheels," an article by Albert H. Dall, assistant research director, is the subject of a four-page two-color publication announced by Cincinnati Grinders Incorporated, Cincinnati 9, Ohio. Copy of Publication G-583 free upon request.

"Let's Look Inside" is the title of a four-page two-color bulletin published by The Heald Machine Co., Worcester 6, Mass., which presents cutaway views of the front and rear of Heald Bore-Matics, including cutaway close-ups, together with corresponding descriptive matter. Copy free upon request.

Condensite Pulley Lagging, an all-purpose waterproof lagging which, it is claimed, can be quickly and easily applied without rivets, bolts, or heat and dries with 10 hours at room temperature, is illustrated and described in a six-page two-color pocket-size folder issued by the Condensite Engineering Corp., 2015 Chancellor St., Philadelphia 3, Pa. Copy free upon request.

Cold Drawn Steel and Drill Rods. The Pittsburgh Tool Steel Wire Co., Monaca, Pa., now has available a 48-page pocket-size catalog containing complete descriptive information, including list prices, on cold drawn steels and carbon tool steels, alloy steels, high speed steel, special tungsten alloy steel, and special steel shapes. General recommendations for the heat treatment of tool steels, plain carbon tool steels, Warplis oil hardening tool steel, and 18 per cent tungsten high speed steel, as well as a list of helpful definitions and suggested uses for drill rods and cold finished steels, are presented. Copy of Catalog No. 4 free.

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Ex-Cell-O Drill Jig Bushings. A catalog listing a complete line of A.S.A. Standard drill jig bushings has been published by the Ex-Cell-O Corp., Detroit 32, Mich. Copy of Catalog No. 11882 free.

American-Lasosol Drill Jig Bushings. A four-page two-color illustrated folder issued by the American Drill Bushing Co., Inc., 1110 S. Santa Fe Ave., Los Angeles 21, Calif., presents complete tabular data on A.S.A. Standard drill jig bushings, including types of bushings, drill sizes, nominal O.D., lengths of bushings, and prices. Copy free upon request.

Heli-Coil Screw Thread Inserts. A 12-page two-color bulletin containing design, specification, and installation data on Heli-Coil Screw Thread Inserts for cap screw, stud, pipe thread, and spark plug assemblies in iron, steel, and light metal castings, forgings, and machined parts has been published by the Heli-Coil Corp., 47-23 35th St., Long Island City 1, N. Y. Copy of Bulletin No. 248 free upon request.

Wilder Toolmaker Microscope is the subject of a four-page two-color folder issued by the George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y. The folder points out numerous advantages of employing microscopic measuring for checking threads, angles, tapers, bevels, and so on. Complete specifications and dimensions of the microscope, as well as a table showing the coordinate measurements possible, are included in the folder. Copy free upon request.


"Know These Facts," an attractive illustrated folder prepared by the Industrial Service Dept., Adamas Carbide Corp., 40-30 23rd St., Long Island City 1, N. Y., describes some typical applications where the wearing qualities of Adamas tungsten carbide can increase the overall efficiency of bed spring manufacturers and other users of wire and wire products. A case history where Adamas carbide wire straightening dies increased die life from two days to over 300 days is presented. Illustrations of various shapes and styles of wire straightening dies, as well as carbide applications for coat hangers, wire rope, and bed springs, are included. Copy free upon request.

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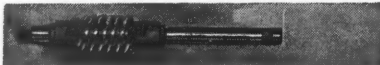
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"Bob-Cat" Electric Hoists are covered as to construction features, advantages, specifications, and prices in an eight-page bulletin released by the Lisbon Hoist & Crane Co., Division of The Wright File Co., Lisbon, Ohio. Copy free upon request.

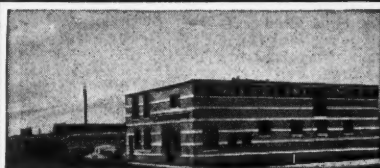
Electrol Four-Way Selector Valve, which is designed to provide a simple and convenient means for controlling flow to the remote actuating cylinders of hydraulic systems, is illustrated and described in a bulletin prepared by Electrol, Inc., Dept. MMS, Kingston, N. Y. Diagrams showing the mechanical features of the valve and illustrating its installation and function are included in the bulletin, copy of which is available free upon request.

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By J. A. Patterson



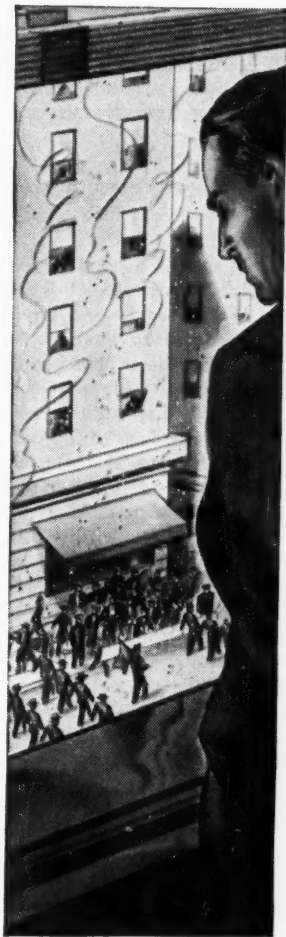
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Over the Editor's Desk

A British Engineer Speaks

LOOKING through our copy of the August, 1948, issue of "Iron and Steel"—a technical magazine published in England—a short article written by a British technical executive caught our eye. Here it is, heading and all:

Why We Are Worried

By a Technical Executive

"As a general rule technical executives of steel works don't bother much about politics. We're too busy anyway. If we really want to keep on top of our job, there's a good deal of metallurgical reading to be done. We have to skim through quite a lot of stuff which may or may not be useful, but we don't want to miss something important and very likely we may wish to present a paper before the local society even if the meetings of the Iron and Steel Institute may be a little beyond us.

"And when we've done all this, there isn't much time or inclination to plough through the dissertations of 'our political correspondent' in the newspaper. Thankfully we turn to the day's sport or to the comic strip.

"But now we are worried. We always thought that we should be comparatively free from interference, whoever owned the industry. We were not concerned with adequate compensation for capital values, for our capital was in our brains, often trained as a result of many long years at night-school, at an age when we would much sooner have been doing something else.

"And why are we worried? They can't run the industry without us can they? Well! In the first place we don't like what we see in the coal trade. They've had nearly two years of nationalization there and our opposite numbers are getting out—if they can. There were 1,000 applications for an overseas mining post recently advertised.

"Another thing that worries us is 'grading.' In the steel trade, incentives have always been reasonably high. If we did a good job and really put our heart into it, the firm was not ungenerous—possibly it was a substantial bonus at the year end, but we knew that if we concentrated on getting the job to run smoothly, they wouldn't forget us. But we shan't get that under nationalization. In the gas industry, even the workmen's profit-sharing schemes are to go.

"We know that in the municipal service, all salaried officials are graded; their jobs are also pensionable, but we don't expect our jobs to become pensionable if we are between 40 and 50. It is too late.

"Again, we have seen what is happening in the coal trade. They are not all graded yet, but the tendency is that way. As far as we can see the set-up will be something like this.

"The salary of a works engineer employed in a factory of 500 employees will be, say, £1,000 (\$4,037.50) rising by £10 annual increments to £1,100 (\$4,441.25), just as in the municipal service. All very nice and safe, isn't it? But if we'd wanted a safe job we'd have gone into municipal service when we left school. And we don't like grading, where talent and mediocrity go hand in hand. So those of us who can will get out.

"Almost every day you open a paper, you see that the steel trade has broken

records. Who do you think plans and organizes this increased production? We do. It is we, the technical executives of all branches of the steel trade who make these records possible. And we do this because we are free. We are not messed about by some vague and ambiguous figure operating at 'very high level.' We get on with the job and when a difficulty arises we don't hang around waiting for a decision. We improvise, but the job goes on.

"And so we are worried. We have no wish to start studying politics at our time of life. We are more at home with the metallurgical press and in the laboratory. But one thing our new masters—if they come—will do well to remember; we have not the slightest intention of being driven."

Note the British technical engineer's statement that the coal industry has been nationalized—"socialized"—nearly two years and that now all of the mining engineers who can do so are getting out. He says that there were 1,000 applications for an overseas mining post recently advertised.

Apparently one of the things that gripes this British engineer is the socialistic method of "grading" under which, as he says, talent and mediocrity go hand in hand. But grading is a necessity under a socialistic form of government—for without it there would be no opportunities for a man to increase his earning power unless a vacancy occurred above him, and then promotions might be made on other bases than those of fitness.

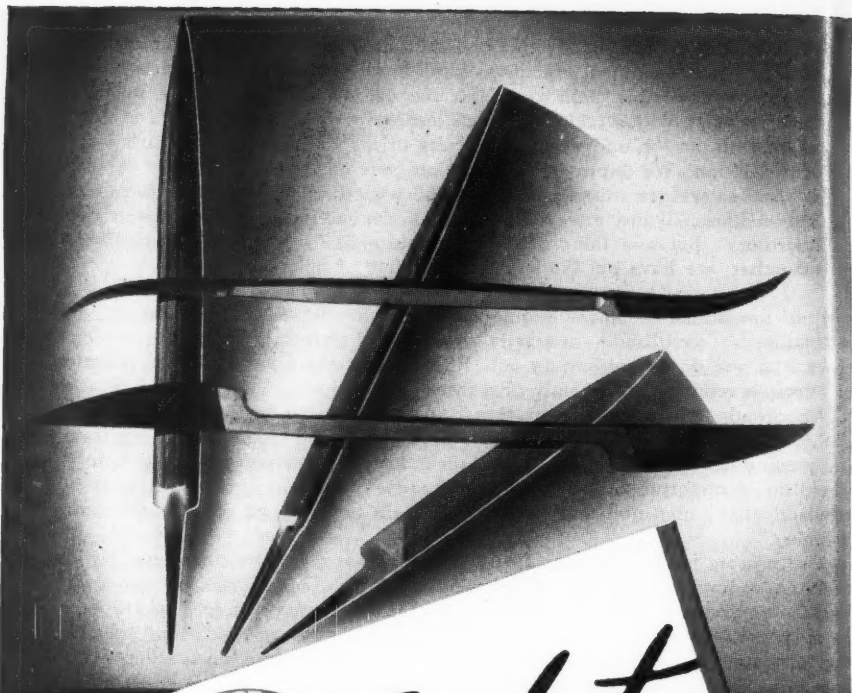
Our present form of government here in America gives the citizen perfect freedom of action, as long as he doesn't trespass on the rights of his neighbors. This is the "we-own-the-government" system. Under socialism every citizen is told where and when he may work for his daily bread, and if he is a farmer, how much land he may have and how much he may grow on it. If he doesn't follow orders, his land is taken away from him. That is the "government-owns-us" system.

Strangely enough, there are a number of Americans who favor the slavery of the "government-owns-us" system. Most of these are men who are neither bright enough nor ambitious enough to qualify for better than mediocre jobs, but who are bitterly envious of others who are able to pull themselves out of the common rut. These envious ones feel that, under socialism, somehow they would become the equals of the intelligent and worthy without having to make any sacrifices or any extra effort to obtain the training and develop the ability by which a man's worth to society should be measured. If America ever accepts a socialistic form of government, such men will quickly discover how wrong they were.

The sad fact is that with the present freedom of action guaranteed to us by our Constitution a citizen can go to the polls on election day and vote for regimentation or even for a totalitarian government—but under the totalitarian form of government he will never be permitted to vote for the return to the free form of government that he abandoned, nor will he ever be permitted to vote again except for the list of candidates that is placed before him by his masters.

Every American who goes to the polls to vote should make sure, before he casts his ballot, that he is not voting for governmental regimentation or governmental controls—for such controls are the beginning of socialism—and socialism can lead only to slavery of the people by the state.

Howard Campbell



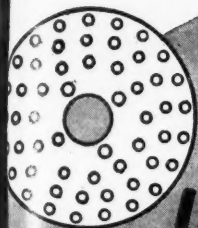
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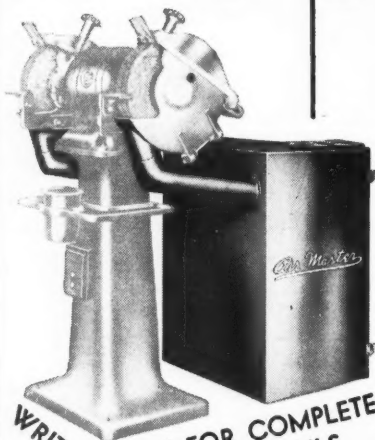
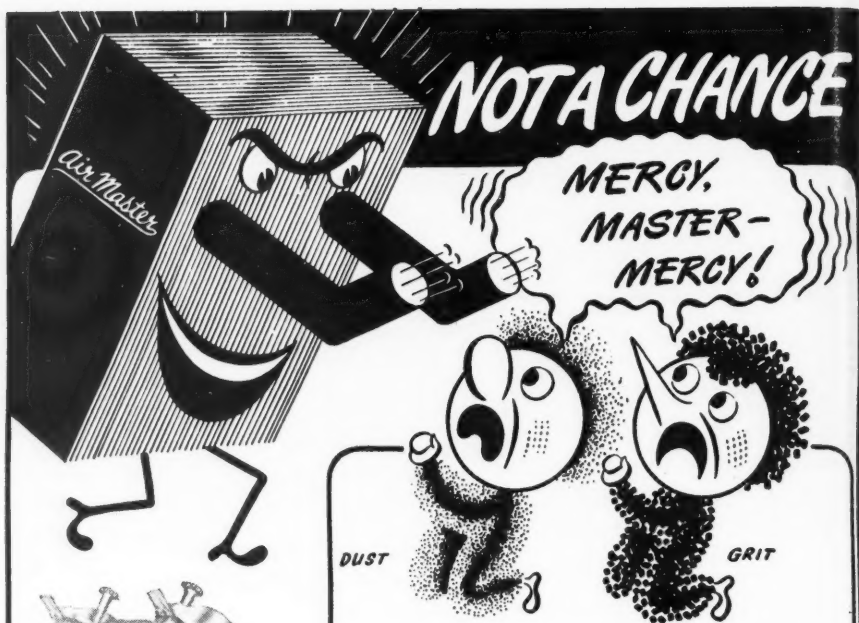
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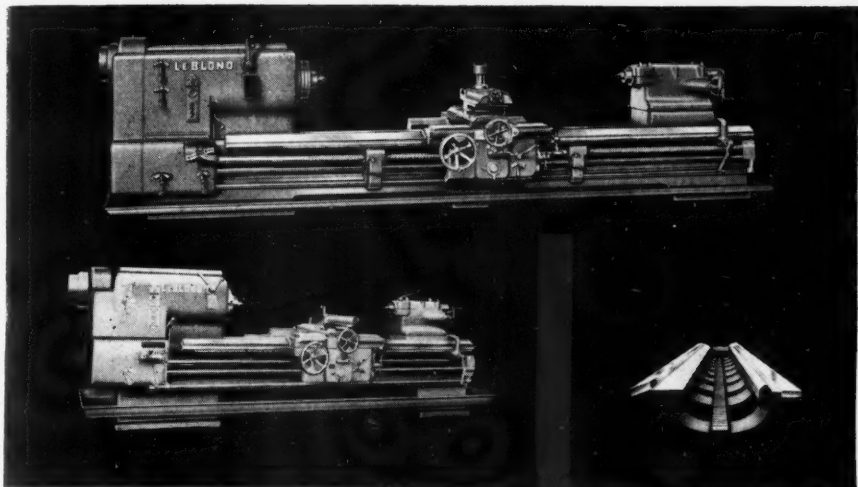
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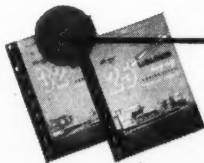


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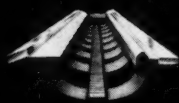
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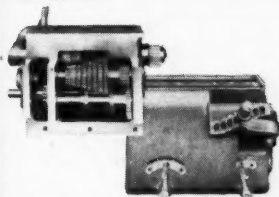


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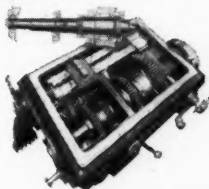
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